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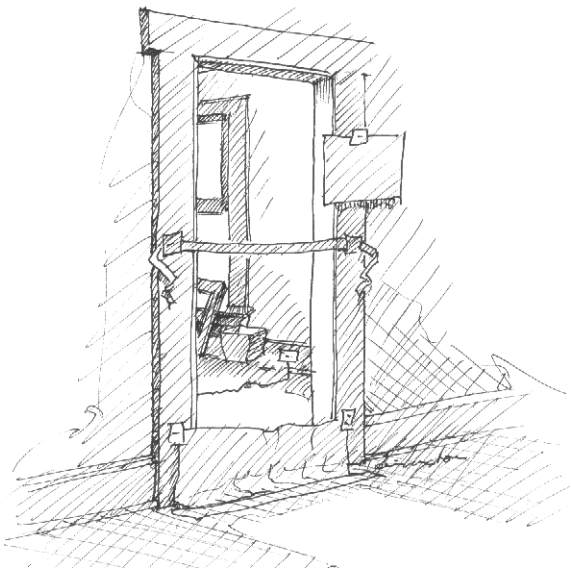
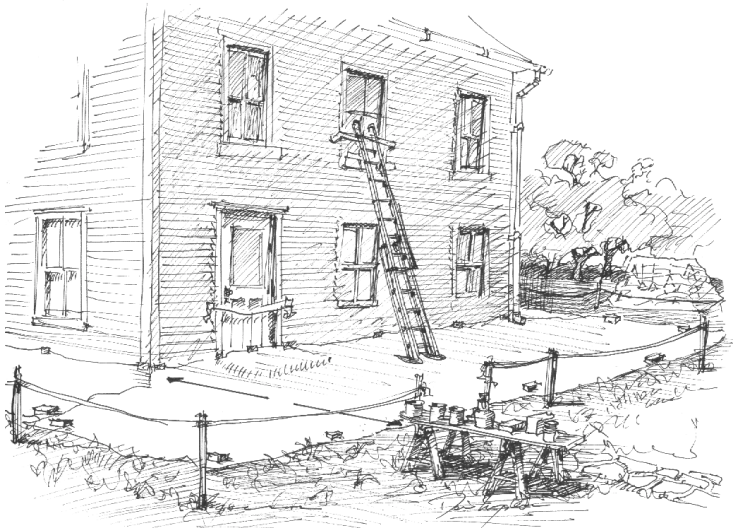
Addressing Lead-Based Paint Hazards During Renovation, Remodeling, and Rehabilitation in Federally Owned and Assisted Housing





FEBRUARY 23, 2001

STUDENT MANUAL

For Use in HUD-Sponsored Lead-Safe Work Practices Training

U.S. ENVIRONMENTAL
PROTECTION AGENCY
WASHINGTON, D.C. 20640

U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410-3000

Dear Trainee:

The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD) thank you for enrolling in this training course, "Addressing Lead-Based Paint Hazards During Renovation, Remodeling, and Rehabilitation in Federally-Owned and Assisted Housing." This course is a part of HUD's efforts to implement its "Lead Safe Housing Rule," and applies to work conducted in federally-owned and assisted housing. The course is based on EPA's model training course, "Minimizing Lead-Based Paint Hazards During Renovation, Remodeling, and Repainting," which was modified to serve the training needs of this audience and includes the requirements of HUD's Lead Safe Housing Rule. EPA encourages the adaptation of its model curricula to address varying federal, state, and local requirements and supports HUD's adaptation of its model curriculum.

EPA's model renovation training course was developed for renovation, remodeling and painting contractors to provide important information regarding the containment, minimization, and cleanup of lead hazards during activities that disturb lead painted surfaces. The model training is part of EPA's effort to ensure that contractors and the public have the information they need to prevent lead poisoning.

Concurrent with the development of its model course, EPA is developing a regulation which may introduce training, certification, and work practice requirements for renovation and remodeling activities. This regulation will not be effective for several years and the specific requirements are not yet known. EPA will update the model course as necessary to reflect the regulation's specific requirements.

Thank you for helping to protect America's children from lead poisoning.

William H. Sanders, III
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency

David E. Jacobs
Office of Healthy Homes and Lead Hazard Control
U.S. Department of Housing and Urban Development

Addressing Lead-Based Paint Hazards During Renovation, Remodeling, and Rehabilitation in Federally Owned and Assisted Housing

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Introduction and Welcome

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Introduction Overview

- Introductions
- Meeting facility and logistics
- Course objective
- Course manual
- Course agenda

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Course Objectives

- **Minimize creation and dispersal of lead-contaminated dust and debris during**
  - Renovation and Remodeling
  - Rehabilitation
  - Maintenance
- **Protect residents, especially children, from exposure to lead-contaminated dust and debris**
  - Set-up and Containment
  - Safe Work Practices
  - Clean-up and Clearance

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Objective

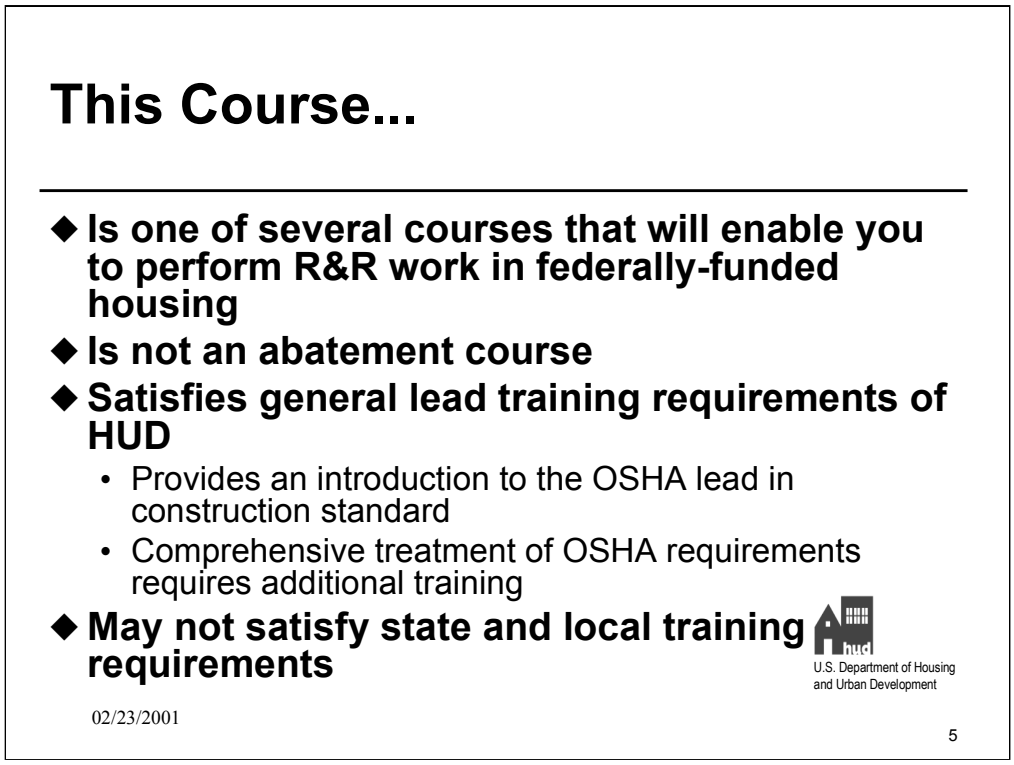
- Upon completion of this course, participants will be able to perform renovation, remodeling, and rehabilitation in a manner that minimizes creation and dispersal of lead-contaminated dust and protects residents, especially children, from possible lead exposure.

Minimize dust and protect children

- This course will show contractors how to perform their work in a manner that creates the least amount of dust possible, and how to contain and clean up the dust that they do create so that it does not spread throughout the house or to neighboring properties.

Who can use this course

- The techniques discussed in this course apply to work performed by a variety of contractors and employees, including plumbers, electricians, residential renovators, remodelers, and painters.

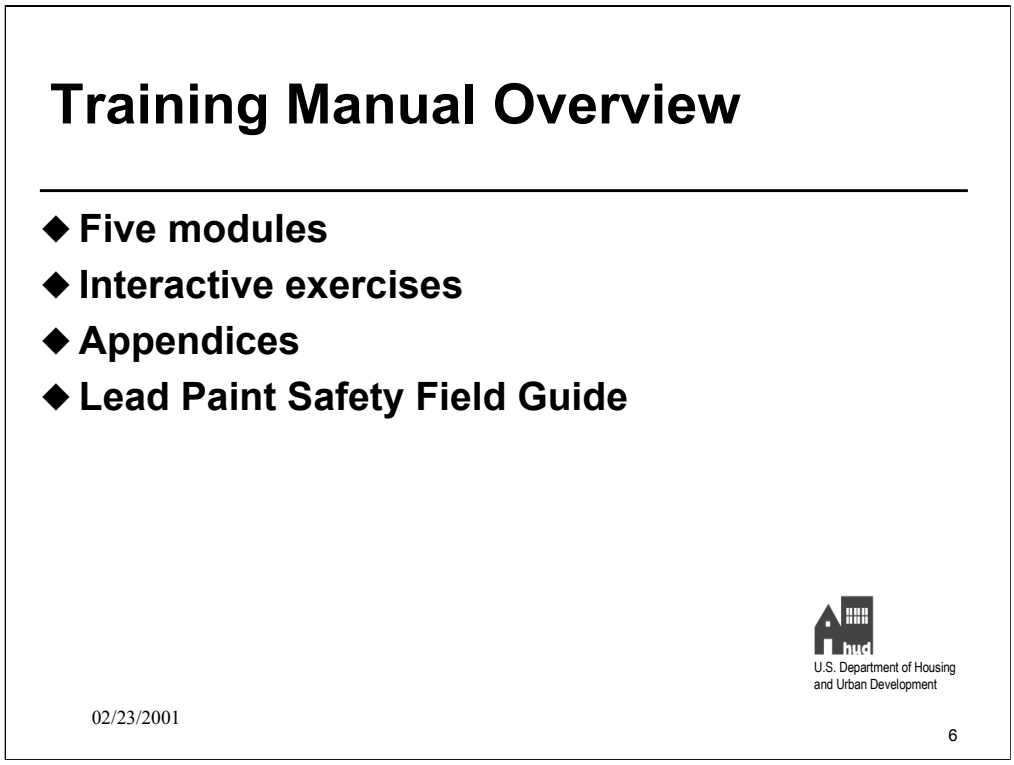


Working in federally-funded housing

- If you perform R&R work on homes or residential buildings that receive federal funding and were constructed before 1978, such as public housing or rehabilitation funded by HUD, you must take a course on working with lead-based paint. A list of courses approved by HUD that meet this requirement can be found on the HUD Website at: http://www.hud.gov/lea/lbptraining.html. For more information on HUD requirements for working on residential properties with lead-based paint, see the appendix on HUD requirements.

Lead abatement training

- EPA defines abatement to mean measures intended to permanently eliminate lead-based paint hazards. This type of work requires special training, not provided by this course, and certification. Many states have defined the term abatement differently and have specific training and certification requirements, therefore, check with your state to obtain information about any state specific requirements. This training does not meet the training requirements of the OSHA Respiratory Protection Standard or project-specific training requirements found in OSHA.



Modules

In addition to this Introduction and Welcome, there are five modules in this course:

- Module 1 Why Should I Be Concerned About Lead-Contaminated Dust?
- Module 2 Talking to Clients and Planning Work
- Module 3 Set-up Your Work Space to Contain Lead-Dust
- Module 4 Safe Work Practices
- Module 5 Clean-up and Check Your Work (Clearance)

Activities and Exercises

- The course includes activities and exercises to help you identify methods of reducing the amount of dust you create, and containing and cleaning up the dust you created. Many of the exercises and activities take place in small groups, so you will have an opportunity to share your experiences and ideas with others in the class.

Appendices

- As indicated in the table of contents, this manual has several appendices that provide extra information that will help contractors.

Field Guide

- This manual also provides you with a copy of the *Lead-Based Paint Safety Field Guide*. This handy Field Guide is easy to use and has illustrations of suggested methods for reducing, containing, and cleaning up dust in work areas. Take it with you to work.

Module 1
Why Should I Be Concerned About Lead-Contaminated Dust?

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Module 1 Overview

- Exercise
- Why is lead-contaminated dust a problem?
- Health risks and effects of lead?
- What is lead-based paint?
- How many homes contain lead-based paint?
- What is the government doing about lead-based paint?
- Summary

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Upon completion of this module, you will be able to explain

- Why we are concerned with lead-contaminated dust
- The health risks of lead to children and adults
- The federal regulations that affect lead-based paint

You will be viewing a video presentation, “Moving Toward a Lead-Safe America” at this time.

Why Are Dust and Debris a Problem?

- **Dust and debris can contain lead**
- **Lead-contaminated dust and debris are poisonous**
- **Small amounts of lead-contaminated dust can poison children and adults**
  - Children swallow it during ordinary play activities
  - Adults swallow or breathe it during work activities
- **Workers can bring lead-contaminated dust home and poison their families**

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Dust and debris from renovation, remodeling, and rehabilitation jobs in pre-1978 housing may contain lead

- Pre-1978 paint may contain lead.
- Renovation, remodeling, and rehabilitation jobs disturb paint that may contain lead.
- Any activity involving surface preparation, such as hand scraping, power sanding, the use of heat guns, and open flame burning, can generate significant amounts of dust. More complicated tasks such as removing building components and demolishing walls also can create a lot of dust.

Renovation, remodeling, or rehabilitation jobs that disturb lead-based paint can create a hazardous situation

- If proper precautions are not taken prior to and during jobs that may generate dust, workers, residents, and children may become lead-poisoned.

Workers may bring home lead-contaminated dust

- A worker's family may be most at risk from being exposed to lead-contaminated dust because dust can be tracked home and into vehicles on the worker's clothing and shoes.

Small amounts of lead-contaminated dust can poison

- A tiny amount of lead can be extremely harmful. A lead-contaminated paint chip the size of your fingernail contains enough lead to poison an adult.
- Lead particles are often so small that you cannot see them, and yet you can breathe or swallow them. Smaller dust particles that are inhaled or swallowed are more easily absorbed by the body than larger particles, and can therefore cause poisoning more easily.

MODULE 1 EXERCISE

Objective: Identify common work practices that produce a lot of dust and debris.

Length: Total Time: 20 minutes.

Directions: In groups of 3 to 5 take 10 minutes to answer the questions below. Assign one person to report your group's answers to the rest of the class.

1. Rank the work practice descriptions according to the amount of dust and paint chips you think they make. In the table below, under the column labeled Rank, write:
   a. 1 next to the work practice that makes the most dust and debris.
   b. 2 next to the work practice that makes the second most amount of dust and debris.
   c. 3 next to the work practice that makes the third most amount of dust and debris.
   d. Continue until you have ranked each work practice according to how much dust and debris you think it will make. A smaller number means that you think the work practice will create more dust or debris than a larger number.

If you think that some work practices make about the same amount of dust or debris you can give them the same rank. If you think that each practice makes different amounts of dust, rank them from 1 to 7.

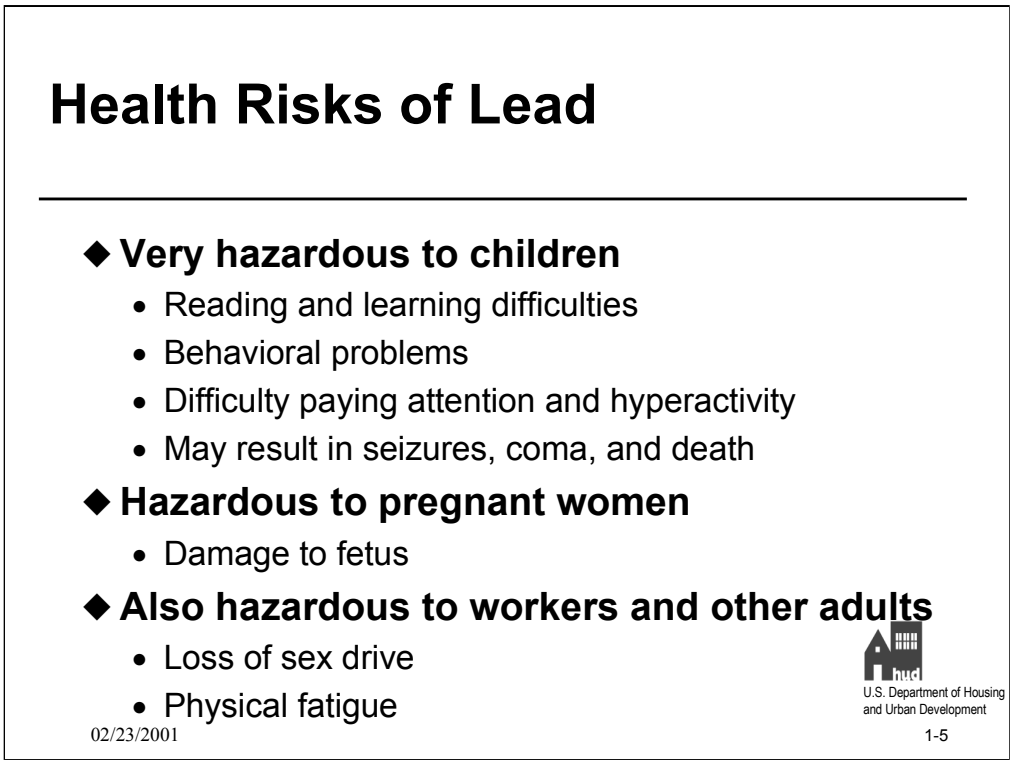
Work Practice Description	Rank
A. Using a power sander with no vacuum attachment to remove interior paint from a plaster wall.	
B. Hand sanding a small (less than 2 square feet) area for surface preparation on an interior room where the paint is in good condition.	
C. Ripping out old kitchen cabinets in a 50 year-old house where the paint on the walls and cabinets is in good condition (e.g., it is not peeling or flaking).	
D. Repairing a sticking window. Loosen the painted sashes, remove inside stop molding, remove top and bottom sash, use a power planer to remove old paint, reglaze and repair the sash as necessary, repair and paint the jamb, reinstall the sash.	
E. Removing old carpeting placed over a hardwood floor in one room.	
F. Demolishing one interior wall using hand or power tools.	
G. High pressure power washing or hydro blasting exterior paint.	

MODULE 1 EXERCISE

2. For the work practice(s) that you ranked #1 (it makes the most dust and debris), tell why you think it makes the most dust and debris.

3. For the work practice(s) that you ranked last (it makes the least amount of dust and debris) tell why you think it makes the least amount of dust and debris.

4. If you actually did any of the jobs described above, what would you do to clean up when the job was finished?



Children, particularly children under six, are most at risk from small amounts of lead

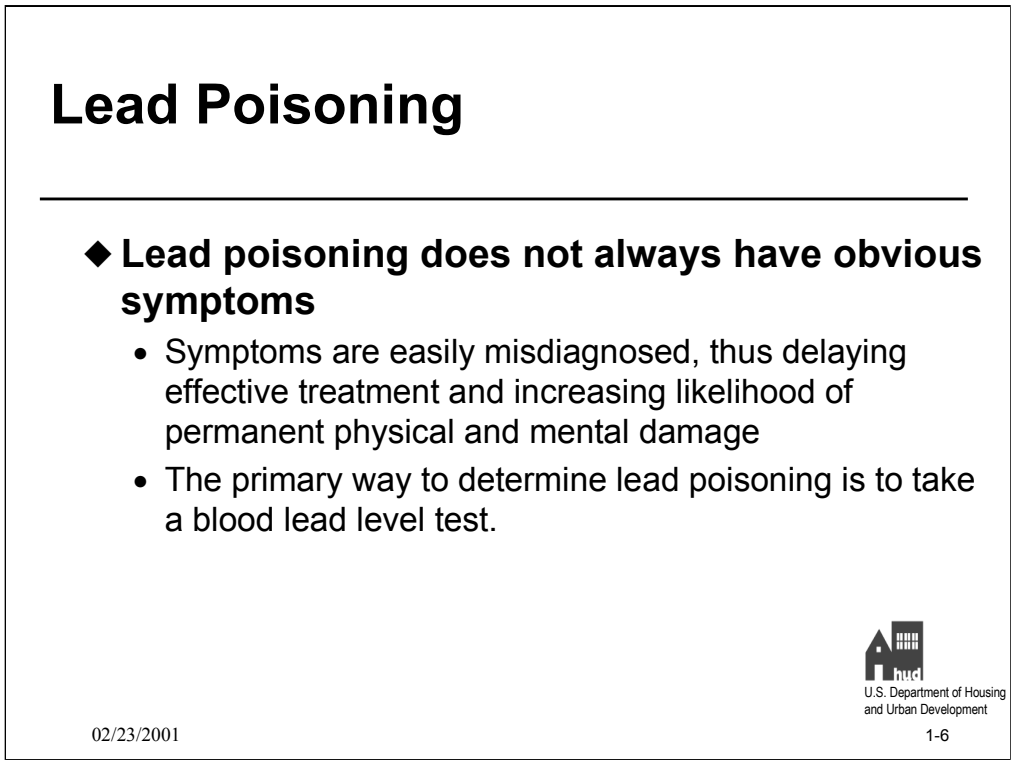
- Children absorb more lead than adults. Because children's brains and nervous systems are still developing, lead causes irreversible brain, nervous system, and organ damage. This can lead to:
  - Reading and learning difficulties in school
  - Behavioral problems
  - Difficulty paying attention and hyperactivity
- In some cases, exposure to lead may have devastating health effects including seizures, coma, and death.
- Children are at a greater risk than adults because during normal and frequent playing or hand-to-mouth activity, children may swallow or inhale dust from their hands, toys, food, or other objects.

- **Among adults, pregnant women are especially at risk from exposure to lead**

- Changes in a woman's body during pregnancy may cause lead stored in her bones to be released into her blood.
- Lead can then be passed from the mother to the fetus. Lead poisoning can cause:
  - Miscarriages
  - Premature births
  - Low birth weight

Health effects of lead in adults include

- Loss of sex drive
- Physical fatigue, lack of coordination, dizziness, muscle or joint aches
- Kidney damage or failure
- Damage to male and female reproductive organs
- Miscarriages in pregnant women
- Headaches and memory loss
- Nausea and stomach aches
- Heart disease and high blood pressure



Lead poisoning does not always have obvious symptoms

- Lead poisoning often has no obvious symptoms, so symptoms are frequently attributed to other causes.
- Specific symptoms that people with lead exposure sometimes complain of include:
  - Headache
  - Stomach ache
  - Irritability
  - Fatigue
  - Loss of appetite
  - Pain in joints
- Because many symptoms are vague or similar to flu symptoms, parents may not get immediate medical attention for their children. This is critical for young children. The longer lead remains in the body of a young child, the higher the risk of permanent damage.
- The best way to determine if lead is present in the body is by testing a person's blood.

Blood Lead Level

- Because lead poisoning does not always have symptoms, the most common way to measure the amount of lead in your blood is the Blood Lead Level (BLL) test. The BLL test:
  - Measures the amount of lead that is circulating in your blood.
  - Tells you about your exposure to lead in the last 2-3 weeks.
  - Does not tell you the total amount of lead in your body.
  - Does not tell you if any long-term damage has occurred.
  - A blood lead level above **10 ug/dl** is not safe for children or for women during pregnancy. The Centers for Disease Control and Prevention consider this to be the "level of concern." A level of 39 ug/dl or less may mean that damage to your body is occurring, even if you have no symptoms. A level of 40 to 49 ug/dl means that serious health damage may occur. A level of 50 ug/dl or greater means that severe health damage is likely, may be permanent, and may occur quickly.
  - HUD's "environmental intervention blood lead level" means a confirmed concentration of lead in whole blood equal to or greater than 20 ug/dl for a single test or 15-19 ug/dl in two tests taken at least 3 months apart. The source of this level was research from the Centers for Disease Control and Prevention (CDC.)

What Is Lead-Based Paint?

- **Lead-based paint is**
  - Any paint or surface coating that contains at least 0.5% lead or 5,000 ppm by dry weight or 1.0 mg/cm^2
  - Some states regulate paint with different concentrations of lead
- **Why was lead used in paint?**
  - Primary pigment
  - Added color
  - Durability and corrosion control
  - Drying agent

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Lead-Based Paint

- Lead-based paint is any paint or other surface coating that contains lead equal to or greater than than 0.5 percent or 5,000 parts per million by weight or 1.0 mg/cm^2 as measured by laboratory analysis or X-ray fluorescence (XRF).
- Paint with concentrations of lead lower than the standard definition above can still cause health problems.

Some states regulate paint with lower concentrations of lead

- You should check with your state to see if the state has requirements that are more stringent than the federal requirements.

Why was lead added to paint?

- Lead was added to paint for color and durability. Lead-based paints stood up to wear and tear, temperature and weather changes, and resisted mold and mildew in moist areas.
- Before the 1950's concentrations of lead in paint were as high as 50 percent by weight. From about 1950 to 1973, the concentration of lead in paint was reduced as other pigment materials became more popular.

Lead-based paint was banned from residential use in 1978

- In 1978 the Consumer Products Safety Commission banned the sale of lead-based paint for residential use. In practice, this means that homes built in 1978 could still have used lead-based paint because existing supplies of paint containing lead would still have been available.

How Widespread is Lead in Housing?

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All Housing	40 percent

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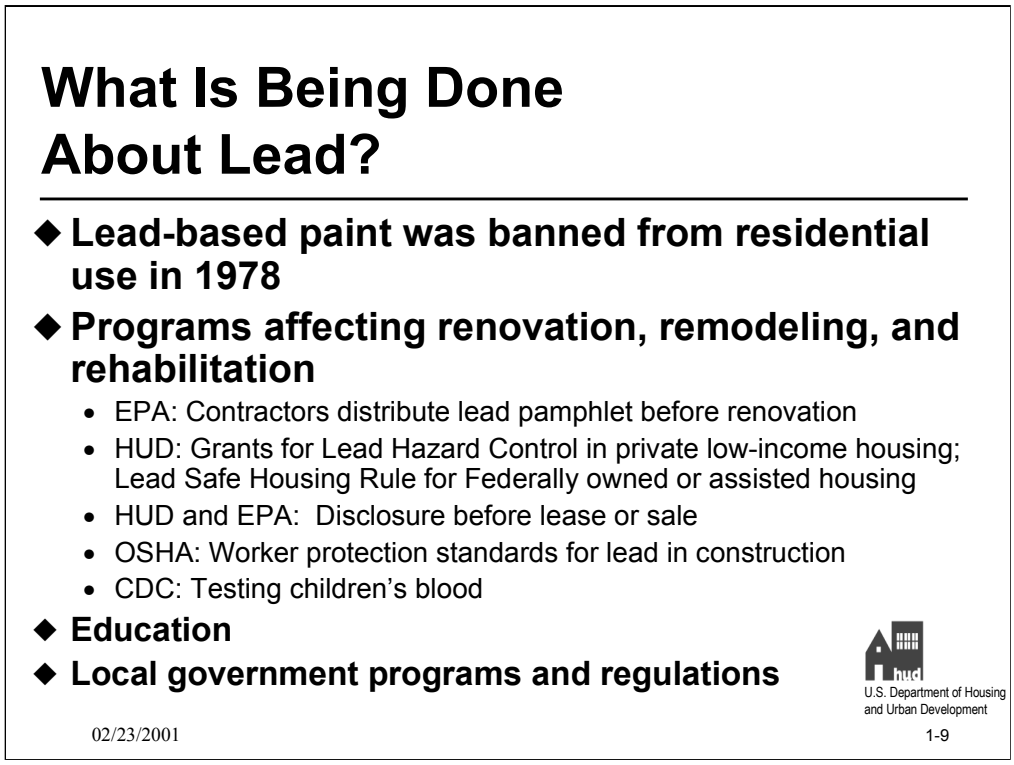
- **Source of data in table above:** *HUD Report on the National Survey of Lead-Based Paint in Housing*, 2001.

Homes built before 1960

- Homes built before 1960 are more likely than homes built after 1960 to contain higher concentrations of lead and to have deteriorated paint surfaces. In the late 1950's paint companies began to use less lead.

Homes built before 1978

- Play it safe. You should assume that any house built before 1978 or earlier contains lead-based paint unless the house has been tested for lead and the results indicate that the house does not contain lead-based paint.



Federal Regulations and Standards

Environmental Protection Agency (EPA) Responsibilities:

•EPA is responsible for protecting human health and safeguarding the natural environment. Under the Toxic Substances Control Act (TSCA), Title IV, EPA has developed or is developing regulations and standards for lead-based paint services and training.

Department of Housing and Urban Development (HUD) Responsibilities:
•HUD is responsible for setting requirements for federally owned or assisted housing and operating the Lead Hazard Control Grant Program for privately owned low-income housing. Most pre-1978 properties receiving HUD funds are subject to HUD requirements for lead-based paint.

Occupational Health and Safety Administration (OHSA) Responsibilities:
•OSHA is responsible for developing standards to protect worker health and safety on the job.

Centers for Disease Control and Prevention (CDC) Responsibilities:
•CDC is responsible for promoting health and quality of life by preventing and controlling disease, injury, and disability.

See Appendix 2 for more information about the regulations and standards set by the four agencies above.

Education

Training courses like this one inform housing providers and renovation, remodeling, and rehabilitation contractors about the potential dangers of lead-based paint and how to prevent potential problems. Both EPA and HUD offer outreach materials and training courses on aspects of lead-based paint.

EPA and HUD information and materials can be obtained on the Internet (www.epa.gov/lead/nlic.htm) and (www.hud.gov/offices/lead) or by contacting the National Lead Information Center at 800-424-LEAD (800-424-5323). CDC guidelines and materials can be obtained on the Internet (www.cdc.gov) or by contacting 800-311-3435.

Title X ("Ten") and Implementing Regulations

- **The Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of the Housing and Community Development Act of 1992)**
- **Goals:**
  - To reduce and prevent childhood lead poisoning
  - To ensure that LBP hazards are integrated into government housing policies
  - Encourage promising and cost-effective methods of hazard reduction
  - Educate the public

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The Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X) was established by Congress to reduce the risk of lead poisoning in Federal Housing stock. Some of the general purposes of this law were to prevent lead poisoning, insure that Federal policies incorporate lead hazards reduction measures, educate the public and develop an infrastructure capable of dealing with lead in housing (e.g., trained and certified professionals such as lead abatement contractors). All lead regulations from federal agencies such as the Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Occupational Safety and Health Administration (OSHA) were developed based on direction found in Title X. This document is the cornerstone of the national lead program.

Title X - Section 402 (c) Renovation and Remodeling

- **Requires EPA to:**
  - Develop guidelines for the conduct of renovation and remodeling activities which may create a risk of exposure to dangerous levels of lead
  - Study the extent to which people engaged in renovation and remodeling activities are exposed to lead, or disturb lead and create a lead-based paint hazard
  - Revise lead-based paint activities regulations to apply them to renovation and remodeling activities that create a lead-based paint hazard

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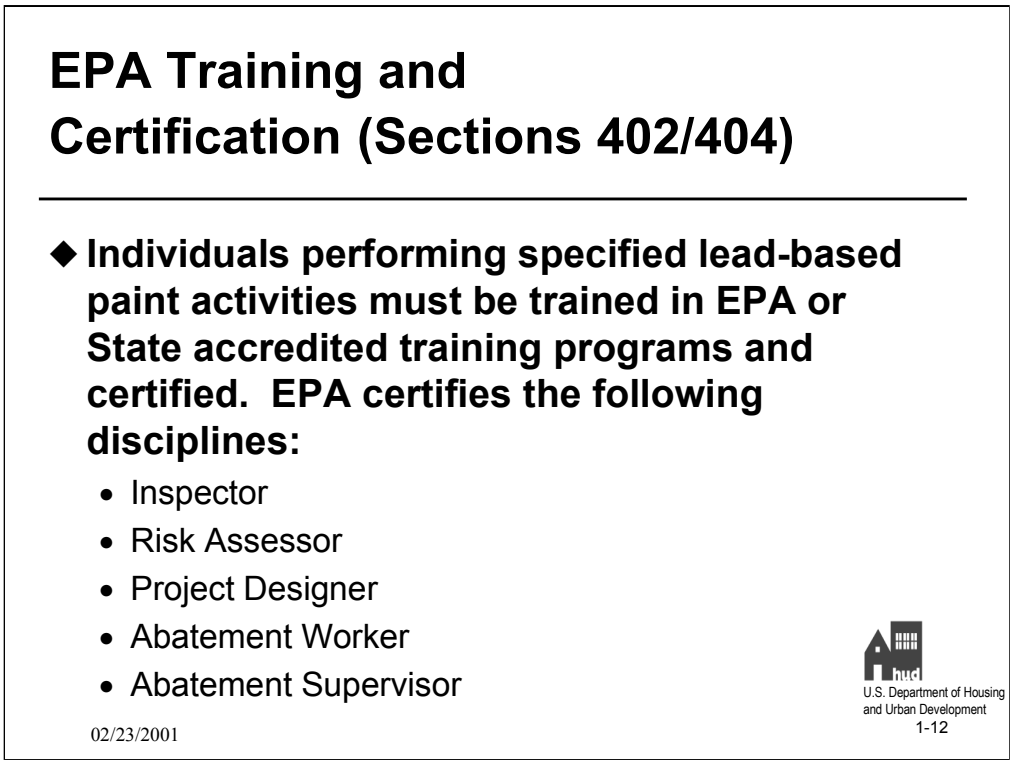

The Environmental Protection Agency (EPA) is the agency leading the development of training requirements for all lead disciplines. In addition to training courses for certification in lead-based paint activities, this course is another example of the type of training that EPA supports to accomplish Title X's goal of developing infrastructure and in educating the public on lead issues.

Title X directs EPA to develop training and certification requirements for lead professions. In response to this EPA has published 40 CFR Part 745 (Also known as the 402/404 Rule). This rule establishes specific training course content, model curricula, certification requirements, and work practice standards for the following lead disciplines:

- Inspector
- Risk Assessor
- Project Designer
- Abatement Worker
- Abatement Supervisor

Your state also may have specific requirements about certification or licensing of lead professionals, so you may need to contact your State lead certification program regulator. Refer to Appendix 9 for more information.

Title X - Section 406(b)

- **Lead hazard information pamphlet**
  - 800-424-LEAD
  - www.epa.gov/lead
  - www.hud.gov/offices/lead
- **Renovation of pre-1978 housing:**

  Renovators, multi-family housing owners, managers receiving compensation shall provide the lead hazard control pamphlet to the owner and/or occupant prior to such activity.

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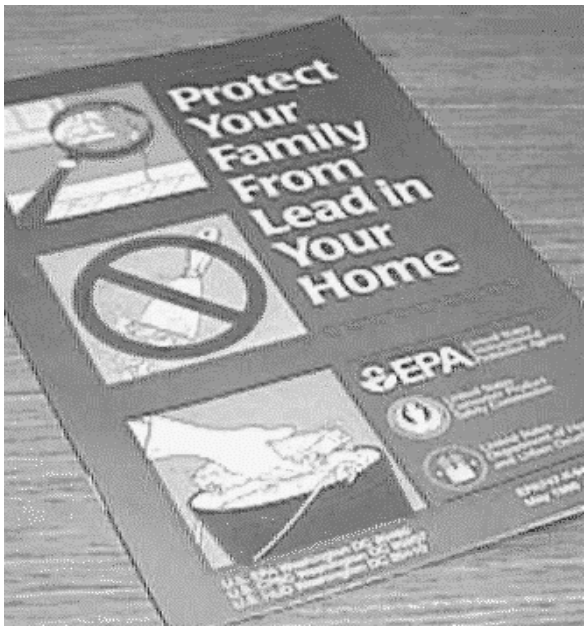
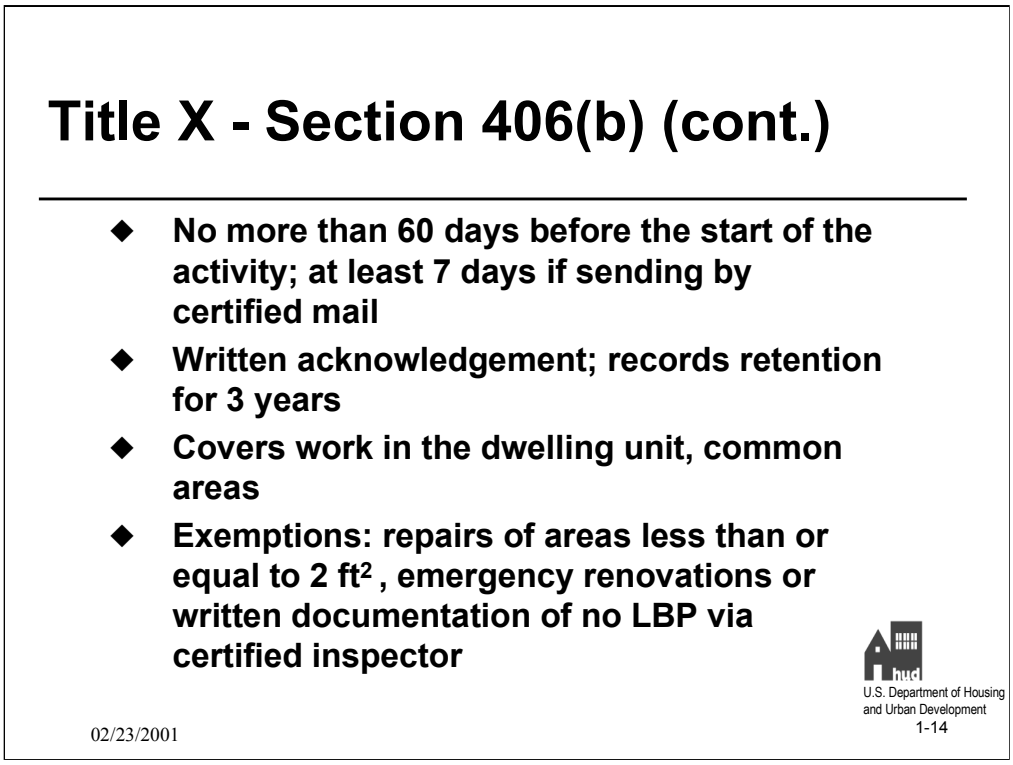
The pamphlet below is the one which **must** be given out. It may be obtained from the National Lead Information Center at 1-800-424-LEAD (5323) or by download from www.epa.gov/lead or www.hud.gov/offices/lead.





Section 406(b) is an important part of Title X for companies performing renovation or remodeling work. It requires communication with the owner about lead before work begins.

In an informational pamphlet about this regulation, EPA describes “emergency renovations” as: “unplanned renovations or activities done in response to a sudden, unexpected event which if not immediately attended to presents a safety or public health hazard or threatens property with significant damage.” They provide two examples of emergency renovations:

- Renovations to repair damage from a tree that fell on a house
- Renovations to repair a pipe break in an apartment complex

Title X - Section 1018

- **The HUD/EPA Disclosure Rule requires:**
  - "Protect Your Family from Lead in Your Home" pamphlet be given to people before they lease or buy pre-1978 housing
    - Renovators give this same pamphlet before starting work
  - Sellers or landlords disclose information about any known lead-based paint or lead-based paint hazards before selling or renting a home.
  - Buyers have up to 10 days to check for lead hazards

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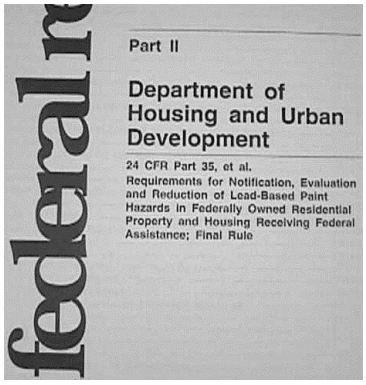
Section 1018 applies to sellers or lessors of pre-1978 housing. It requires that sellers disclose information about lead to potential buyers. They must disclose information they have about the presence of lead-based paint or LBP hazards. The buyer has 10 days to obtain an inspection or risk assessment. Owners of rental housing must disclose such information to potential renter before a lease is signed. This pamphlet is the same pamphlet that renovators and remodelers provide to clients before work begins.

HUD's Lead Safe Housing Rule

- **Pre-1978 housing receiving HUD or other Federal assistance**
- **Pre-1978 Federally owned housing being sold**
- **Required activities vary by type of assistance**



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The Section 1012/1013 regulation ("Lead Safe Housing Rule") covers Federally assisted housing and Federally owned housing which is being sold. Housing owned and operated by a Federal agency other than HUD is not covered by this regulation.

The word HOUSING is highlighted because the regulation does not cover "Child Occupied Facilities" unless they are part of a property covered by the regulation.

HUD's Lead Safe Housing Rule: Interim Controls

- **Training requirements for personnel**
- **Includes occupant protection and clearance**
- **Activities include:**
  - Paint stabilization
  - Friction or impact surfaces
  - Chewable surfaces
  - Dust-lead hazard control
  - Soil-lead hazard control

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Interim controls are defined by HUD as, "a set of measured designed to reduce temporarily human exposure or likely exposure to lead-based paint hazards. Interim controls include, but are not limited to, repairs, painting, temporary containment, specialized cleaning, clearance, ongoing lead-based paint maintenance activities, and the establishment and operation of management and resident education programs."

Risk assessors may recommend interim controls for controlling lead-based paint hazards.

Note: HUD's Lead Safe Housing Rule's definition of paint stabilization includes repainting and correcting the source of damage.

HUD Lead Hazard Criteria

•Deteriorated paint

•Lead in dust (clearance/risk assessment)

Floors	40	$\mu g/ft^2$
Interior window sills	250	$\mu g/ft^2$
Troughs (clearance only)	400	$\mu g/ft^2$

•Lead in bare soil (risk assessment)

Play areas	400	µg/g
Other soil	1,200	µg/g

HUD's Lead Safe Housing Rule: Safe Work Practices

- **Included in:**
  - Ongoing LBP Maintenance
  - Paint stabilization
  - Rehabilitation
  - Standard treatments
- **Prohibited methods**
- **Occupant protection and worksite preparation**
- **Specialized cleaning**
- **De minimis levels (24 CFR 35.1350)**

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The Lead Safe Housing Rule requires lead safe work for the activities listed on the slide. It specifies prohibited practices, requirements for protecting occupants, preparing the work site. Special cleaning techniques must be used, and clearance achieved.

All areas of deteriorated paint must be repaired. However, if an area of deteriorated paint is below the "de minimis" amount, it means it is a small area and lead safe work practices and clearance are not required.

The de minimis levels are:

•20 square feet on exterior surfaces

•2 square feet in any one interior room or space

•10 percent of the total surface area on an interior or exterior type of component with a small surface area

HUD's Lead Safe Housing Rule: Clearance Examination

- **Visual Assessment**
- **Dust sampling**
  - Interim Dust Lead standards
  - Will be changed to EPA's standards when effective
- **Certified, or trained and supervised personnel**

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Visual Assessment means looking for, as applicable, deteriorated paint, visible surface dust, debris and residue as part of a risk assessment or clearance examination, or completion or failure of lead hazard reduction.

Before a supervisor releases an area for clearance test to be performed, the supervisor should do his own visual inspection of the area to make sure it is clean.

HUD's Lead Safe Housing Rule: Dust Lead Standards

HUD uses these clearance standards:

- **Floors** **40 μg/ft²**
- **Interior window sills** **250 μg/ft²**
- **Window troughs** **400 μg/ft²**

Need to clean carefully to meet these standards.

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These are EPA's clearance standards, which HUD uses.

Know The HUD Rule!

You may obtain a copy of the regulation from NLIC at (1-800-424-LEAD) to ensure an understanding of the requirements.

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Individuals performing renovation, remodeling, and rehabilitation in pre-1978 housing need to understand the HUD Lead Safe Housing Rule. Appendix 2 contains summary fact sheets on this regulation.

HUD's Lead Hazard Control Grant Program

- **Targeted to private homes owned or occupied by low-income families**
- **Since 1993, the program has:**
  - Provided 177 grants totaling $552 million to 112 State and local governments in 35 states and DC
  - Educated families on how to eliminate or reduce children's lead exposure.

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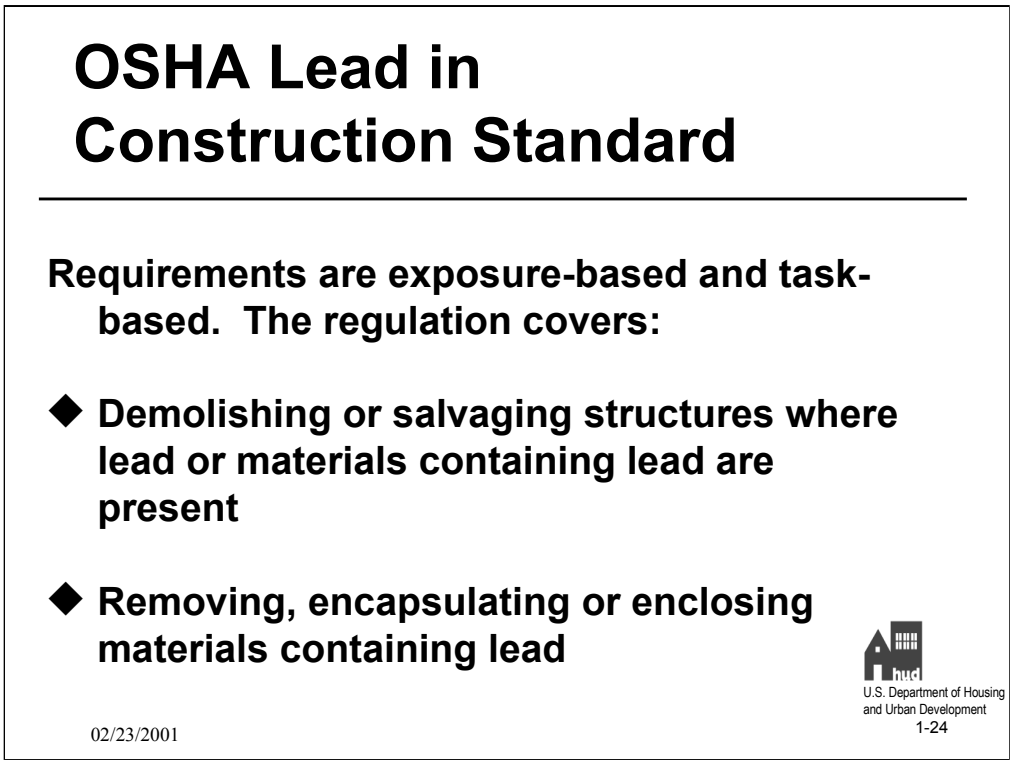
The HUD Lead Hazard Control Grant Program has completed lead hazard reduction in over 30,000 homes. Most of the work done in these homes consisted of lead interim controls. More information on this program may be found by visiting the HUD Office of Healthy Homes and Lead Hazard Control web site at www.hud.gov/offices/lead.

The major OSHA regulations pertaining to lead are listed on this slide. A comprehensive treatment of OSHA requirements requires additional training. More detailed information on the lead in construction and hazard communication standards are included in this manual. Information on the OSHA Lead in Construction Standard are located in Appendix 7. For information on the Hazard Communication standard, see Appendix 8.

29 CFR 1926.62 The OSHA Lead in Construction Standard went into effect June 3, 1993. It applies to all workers doing construction work who may be exposed to lead on the job. This specifically includes repair and renovation work. This manual covers the major sections of the standard on following slides.

29 CFR 1910.1200 (General Industry) and 29 CFR 1929.59 (Construction) The OSHA Hazard Communication Standards cover all individuals that work with or around hazardous chemicals. It allows employees to gain access to information about the hazards of substances they work around, safe work practices and how to protect themselves. They require employees receive training about the specific chemicals in a workplace, labeling and Material Safety Data Sheets.

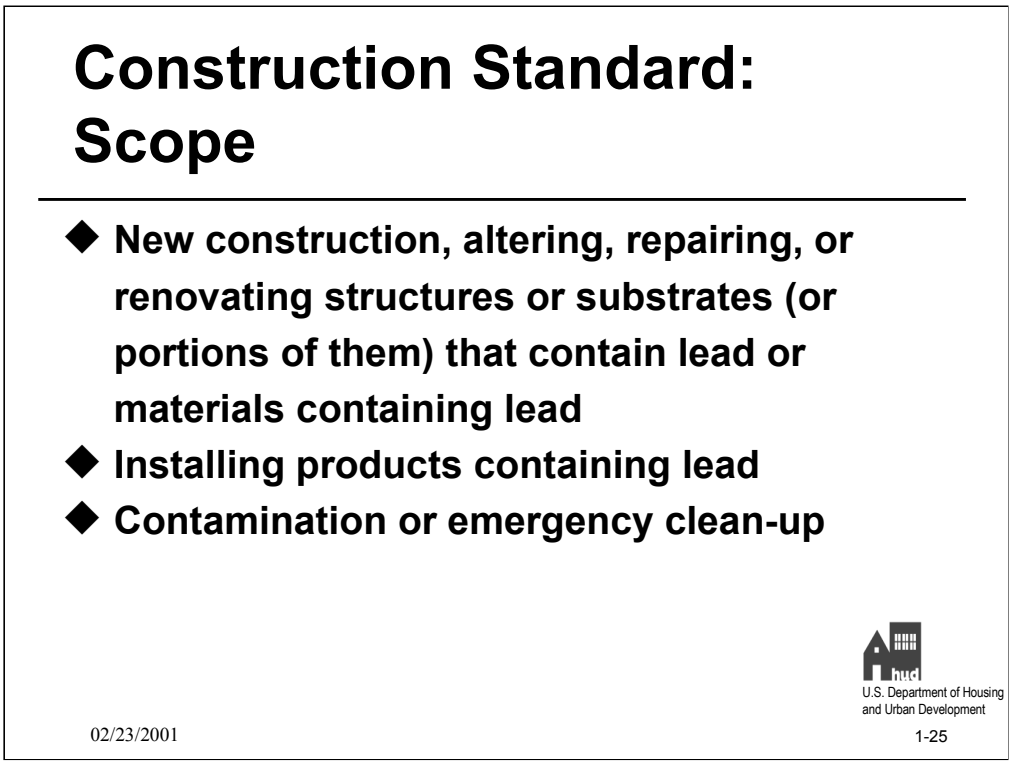
Employees are covered by one or more of these regulations if lead in their workplace is disturbed.



Some of the requirements of this regulation are based on the work that is done; others are based on employees' potential for exposure. Employers need to be familiar with all of these requirements.

The OSHA Lead in Construction Standard covers a broad range of work activities. This standard covers every phase of construction work, if employees have the potential for occupational lead exposure. The standard specifically states, "All construction work excluded from coverage in the general industry standard for lead by 29 CFR 1910.1025(a)(2) is covered by this standard." It also states, "Construction work is defined as work for construction, alteration and/or repair, including painting and decorating."

Demolition or salvage of structures where lead or materials containing lead are present and removal, enclosure or encapsulation may be large-scale projects are covered under this regulation. The terms, "removal, enclosure, or encapsulation" are also used to refer to activities done by specialty lead abatement contractors who are certified to do this type of work, so this standard clearly applies to those abatement activities as well.



Many R&R activities are covered under this regulation. Despite the fact that the Consumer Product Safety Commission limits the amount of lead that can be in paint for residential use, other products used in new construction still contain lead (e.g., sheet lead used in roofing.) This regulation covers structures or substrates that contain lead, installation of products containing lead or clean-up activities. Therefore, R&R contractors, plumbers, roofers, welders, painters, and a host of other types of firms are covered by this regulation because they use lead.

OSHA's definition of "lead" is very important. OSHA defines lead as, "metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds." This means that OSHA has not limited employee exposure to lead from paint. OSHA does not put a limit on how much lead needs to be in a product for it to be a potential problem for employees. It means that any amount of lead from any source on a job site could be a problem. That is where knowledge about the products and activities on a worksite becomes important, and why training is a requirement in many OSHA regulations.

OSHA does not define or regulate "lead-based paint." This is an EPA/HUD term. OSHA protects employees from exposure to lead from any source or during "lead-related trigger tasks." These will be discussed further on page 1-27.

Construction Standard: Scope (cont.)

- **Transporting, disposing, storing or containing lead or materials containing lead where construction activities are performed;**
- **Maintenance operations associated with the activities mentioned above**

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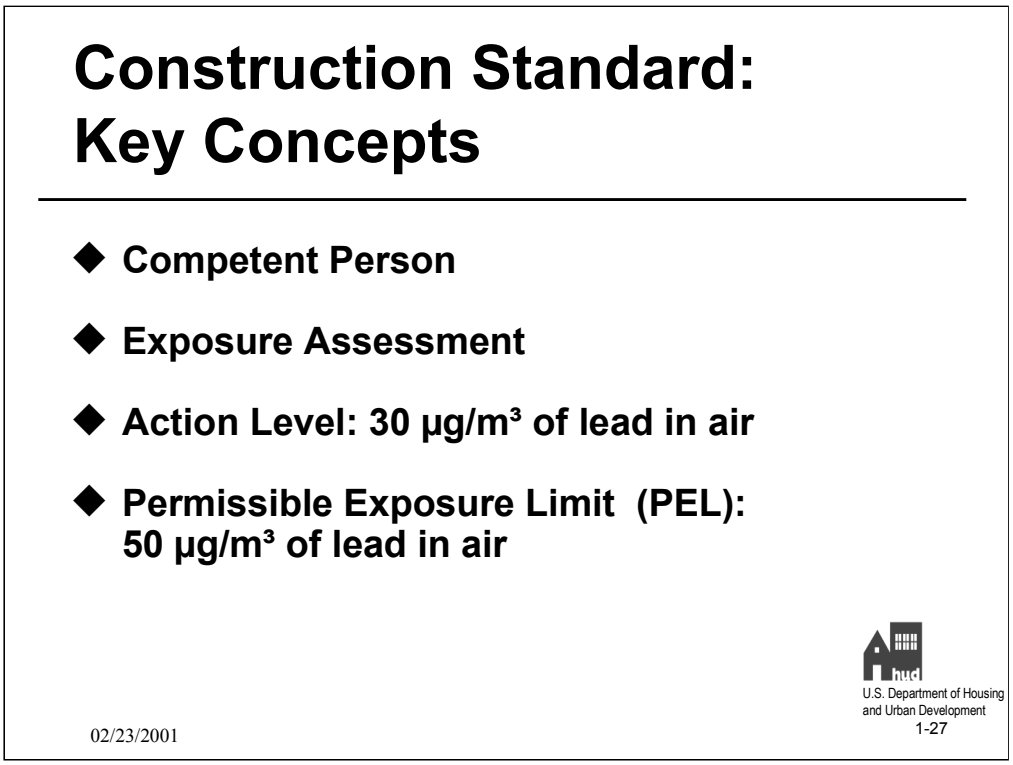
Construction work involving moving or transport of lead or materials containing lead is also covered under this regulation. This includes disposing or storing of lead materials on a job site and associated maintenance work, including sorting waste materials, putting plastic drop cloths in bags for disposal, carrying bags of waste or building components to a dumpster, or other similar activities.



OSHA requirements depend on the level of lead exposure a worker has on the job. A *"competent person"* is responsible to identify existing and predictable lead hazards and who has the authority to correct them. The competent person is responsible for assessing the job and having air samples taken in the worker's breathing zone and analyzed. Workers must be protected during this "*exposure assessment*." The employer is required to give employees the results of the air sampling within five working days of receiving the results. If a worker's potential for exposure is high, OSHA regulations are more stringent. These requirements are designed to protect workers with potential for exposure to lead.

"Action Level" means employee exposure, without regard to the use of respirators, to an airborne concentration of lead at or above 30 micrograms per cubic meter calculated as an 8-hour time-weighted average. This means the exposures over a shift are averaged. The employer must provide medical surveillance and training when employees are exposed at the action level. Respirators, protective clothing, and other more restrictive procedures are not required AT THIS LEVEL OF EXPOSURE.

"*Permissible Exposure Limit*" means an employer is not allowed to expose an employee to lead at concentrations above 50 micrograms per cubic meter of air averaged over an 8-hour time period. If you work in an area with more lead in the air than this level, the employer must reduce your exposure.

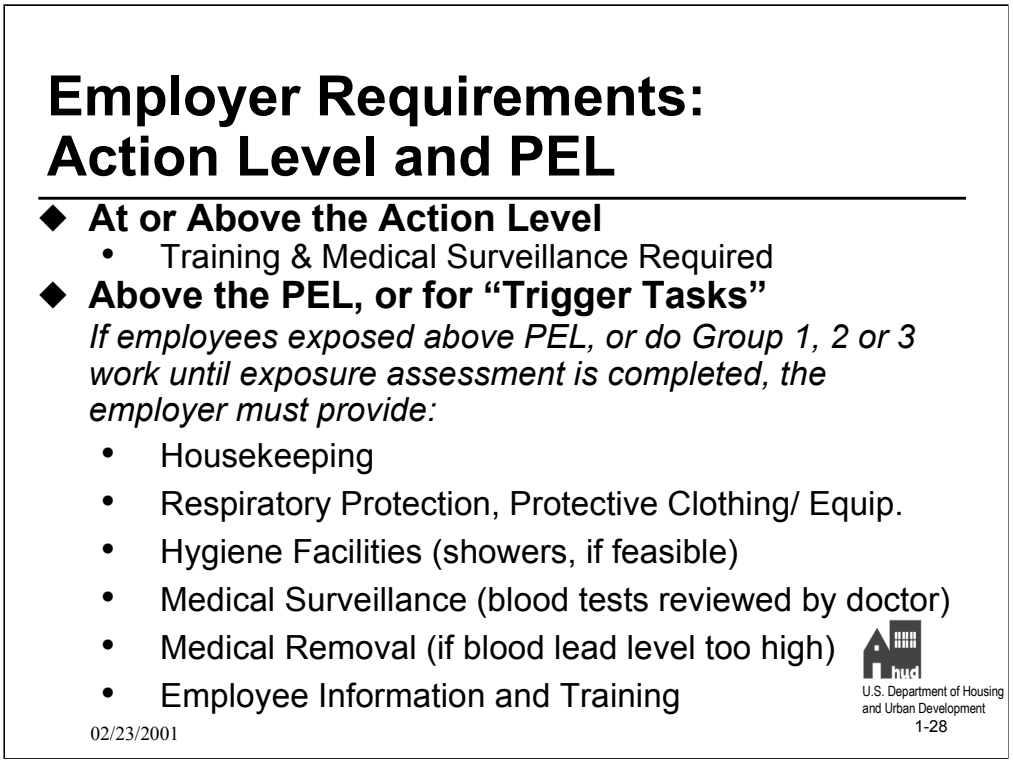
Lead-related trigger tasks are divided into three groups:

Group 1: Manual demolition of structures, dry manual scraping or sanding, using a heat gun, power tool cleaning with dust collection systems, spray painting with lead-based paint. *NOTE: Group 1 activities, prior to initial assessments, require employee protection as if lead exposure is greater than 1-10 times the PEL (50 to 500 µg/m³.)*

Group 2: Using lead-based mortar, burning lead, rivet busting, power tool cleaning without dust collection systems, movement or removal of abrasive blasting containment, clean up activities where dry expendable abrasives are used. *NOTE: Group 2 activities, prior to initial assessments, require employee protection as if lead exposure 10-50 times the PEL (500 to 2500 µg/m³.)*

Group 3: Abrasive blasting, welding, torch cutting, torch burning. *NOTE: Group 3 activities , prior to initial assessments, require employee protection as if lead exposure is greater than 50 times the PEL (greater than 2500 µg/m³.)*

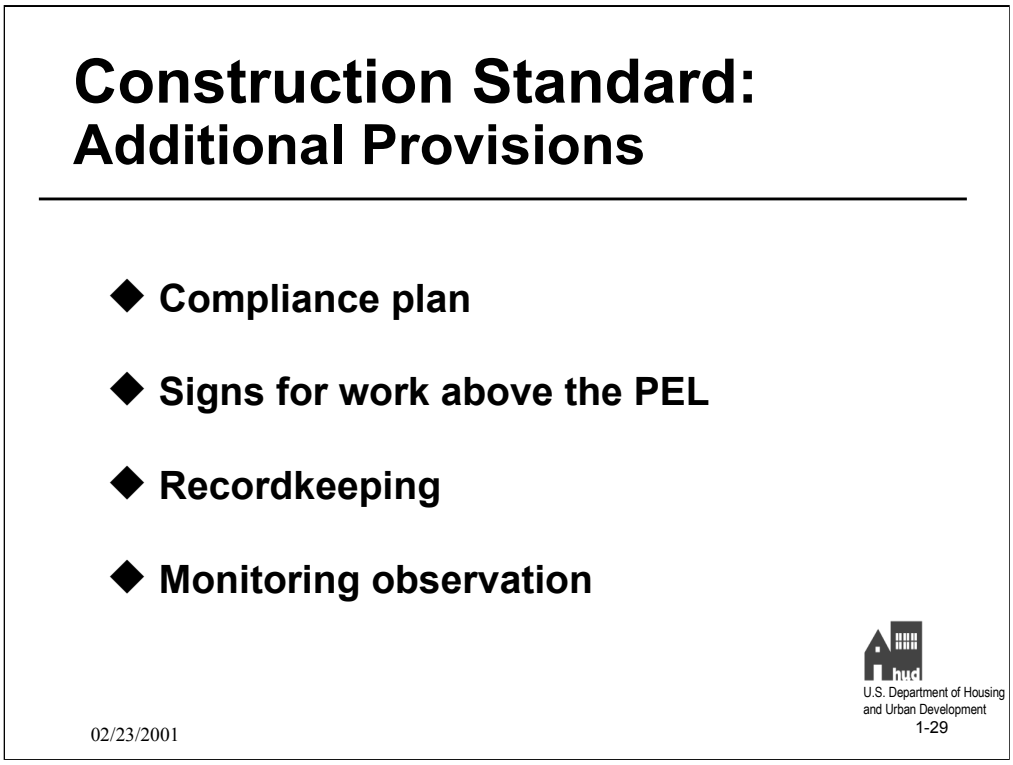
OSHA's available data has identified high lead exposures related to "trigger" tasks. Employers must provide a higher level of protection when employees perform lead-related trigger task until the exposure assessment shows that your exposure is below the PEL.



Many of the work practices covered in this training course are also required by OSHA, such as good housekeeping practices, working clean and use of good hygiene by employees. *Note: Specific training topics in Appendix 7 of this text.*

If an employee is exposed above the Permissible Exposure Limit (PEL) or performs "trigger tasks," and the employer has not performed an initial exposure assessment the employer must provide more protection including engineering controls and work practice controls to reduce exposures below the PEL. This protection includes:

- Good housekeeping includes maintaining all workplace surfaces free of lead dust accumulations. Good housekeeping involves a regular schedule to remove accumulated lead dust and debris, cleaning floors and other surfaces, vacuums with HEPA filters; (shoveling, dry or wet sweeping shall only be used where vacuuming has been tried and is ineffective), and HUD prohibits the use of compressed air to remove lead from surfaces. Note: Housekeeping is required for all lead jobs.
- The proper respirator for the job, respirator fitting and training; protective clothing such as coveralls, gloves, hats, shoes or disposable booties for the shoes, face shields or other appropriate equipment; no blowing or shaking of contaminated clothing, closed container for used protective clothing.
- Facilities for hand and face washing; showering, if feasible.
- An accessible lunchroom facility or eating area must be available and as free from contamination as practical.
- Initial blood tests reviewed by a physician must be provided if an employee does any Group 1, 2 or 3 tasks ("trigger tasks") or if the employee is exposed at or above the action level any one day. Ongoing medical surveillance is required if an employee exposed to lead at or above the action level for more than 30 days in a 12-month period.
- Removal from lead work area if blood lead level is too high (50 ug/dl).
- The OSHA standard prohibits chelation to prevent lead poisoning (a chemical to remove lead from the body).



OSHA requires employers develop a lead compliance plan to state how they plan to comply with the lead requirements. A sample lead compliance plan can be downloaded from the HUD web site at www.hud.gov/offices/lead. It is located in Chapter 9 of the HUD Guidelines for the Evaluation and Control of Lead Hazards.

Note: OSHA requires the the development and implementation of a written compliance plan prior to the commencement of the job where employee exposure to lead without the use of respiratory protection will be in excess of the PEL.

The regulation also requires signs in the work area where employees are exposed at or above the PEL. Signs must be kept clean and illuminated. The sign must say:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

The employer must keep records of all employees, social security numbers, job duties, exposure assessments, type of respiratory protection worn on the job site, medical surveillance and medical removals. The employer must also keep good records of all lead exposure monitoring, medical surveillance, and medical removals. Refer to 29 CFR 1926.62(n) for specific information.

Employers must offer employees or their designated representative the opportunity to observe any monitoring of employee exposure to lead. Employees must be provided the opportunity to observe all steps related to the monitoring of lead, and are entitled to an explanation of the measurement procedure, the right to record results or receive copies of results when returned from the lab.

Additional OSHA Regulations

- **Respiratory Protection: 29 CFR 1910.134**
- **Personal Protective Equipment: 29 CFR 1910.132**
- **Sanitation: 29 CFR 1926.27**
- **Other construction safety standards**

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For information on the OSHA Respiratory Protection Standard Overview, see Appendix 6. For copies of OSHA standards, go to www.osha.gov.

Many OSHA regulations have similar requirements:

- Keep work area clean and free of hazards
- Assess the job and protect employees
- Use safe work practices
- Provide hygiene facilities for washing hands and face, showering if feasible
- Train employees about workplace hazards
- Do the job right and keep good records
- Access to medical and exposure records

Other construction safety standards include fall protection; scaffolding; ladder safety; eye,head and foot protection; walking/working surfaces; lockout/tagout; respiratory protection; electrical safety, etc.

These standards may require additional training.

Lead Information Resources

- **EPA -** <www.epa.gov/lead>
- **HUD Lead Web site -** <www.hud.gov/offices/lead>
- **OSHA -** <www.osha.gov>
- **National Lead Information Center**
  - Copies of the regulation
  - 1-800-424-LEAD
- **Lead professionals listing**
  - <www.leadlisting.org>

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You can get the information you will need about Federal requirements from these sources. Firms can contact the Leadlisting and be listed as a Lead Safe Renovator if you wish.

Module Summary

- **Now you know**
  - Why we are concerned with lead-contaminated dust
  - The health risks of lead to children and adults
  - The regulations that affect lead-based paint

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The modules in the rest of the course describe how proper set-up and containment, safe work practices, and clean up techniques leave less lead-contaminated dust and debris than standard renovation, remodeling, and rehabilitation work practices.

Module 2

Talking to Clients and Planning Work

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Module 2 Overview

- **At the end of this module, you will be able to answer the following questions:**
  - Do I need to use lead safe work practices?
  - How can I communicate information about the associated planning, cost, and time demands to the residents?
  - Should the paint be tested before starting work?

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Planning Ahead

- You should also talk to the residents about why you are performing lead safe work practices and describe what the residents can do to help prevent the spread of dust both before you start the project and while you are working.
- To safely work in homes with lead-based paint, it is essential that you plan a strategy to reduce the creation of dust and contain any dust created. The time invested in these activities will ensure your project is conducted safely with regards to lead dust hazards and expedite the cleanup process.

What are Your Supervisor's or Agency's Responsibilities?

- **Under federal law, if disturbing more than 2 sq. ft. of painted surfaces in pre-1978 housing, you MUST:**
  - Give residents copies of the pamphlet *Protect Your Family From Lead In Your Home* (see attachments)
  - Get confirmation that residents received the pamphlet
  - Keep confirmation records for three years
- **See *The Lead Pre-Renovation Education Rule*** *(40 CFR Part 745)* ***or Lead-Based Paint Poisoning Prevention In Certain Residential Structures*** *(24 CFR Part 35)* **for confirmation forms and guidance (see attachments)**

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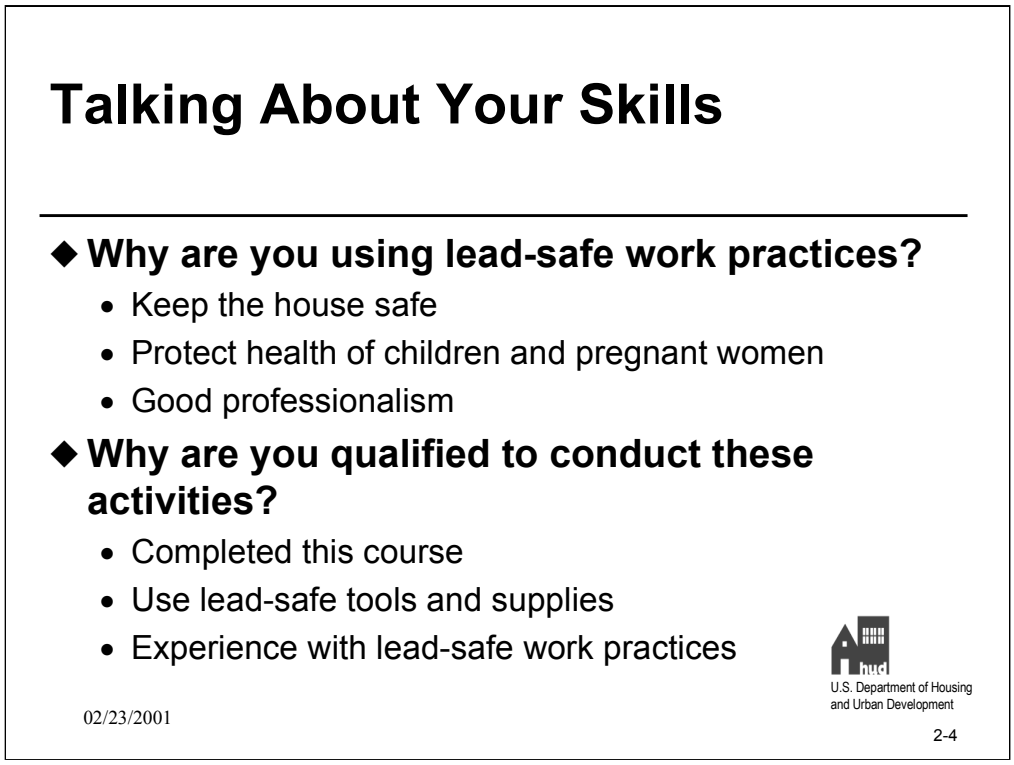
Legal Obligations

- Federal law requires contractors to tell occupants about the risks of lead-based paint before non-emergency repair, maintenance, and home renovation work begins. This law applies to all work on surfaces greater than 2 square feet per component. Contractors MUST:
  - Give residents a copy of the pamphlet *Protect Your Family From Lead In Your Home* before starting any work.
  - Either have the resident sign an acknowledgment form after receiving the pamphlet or send the resident a copy of the pamphlet via certified mail.
  - Keep copies of the residents' confirmation of receipt of the lead pamphlet or certificate of mailing for three years as documentation of your compliance with the regulations.

- Forms for confirmation of receipt of the lead pamphlet are included in the *Lead Pre-Renovation Education* handbook in Appendix 4 .
- Copies of both the *Protect Your Family From Lead In Your Home* and the *Lead Pre-Renovation Education Rule* handbook are included in Appendices 3 and 4, respectively. See the handout: *Resources for additional information* that accompanies the exercise later in this lesson for a list of where you can obtain these documents.

- Some states and local governments may have additional requirements for working on homes with lead-based paint. You can periodically check with the National Conference of State Legislatures (NCSL) for updates to state laws affecting lead-based paint for all states. The 1999 compilation is located at: http://www.ncsl.org/programs/ESNR/pblaw99.htm.

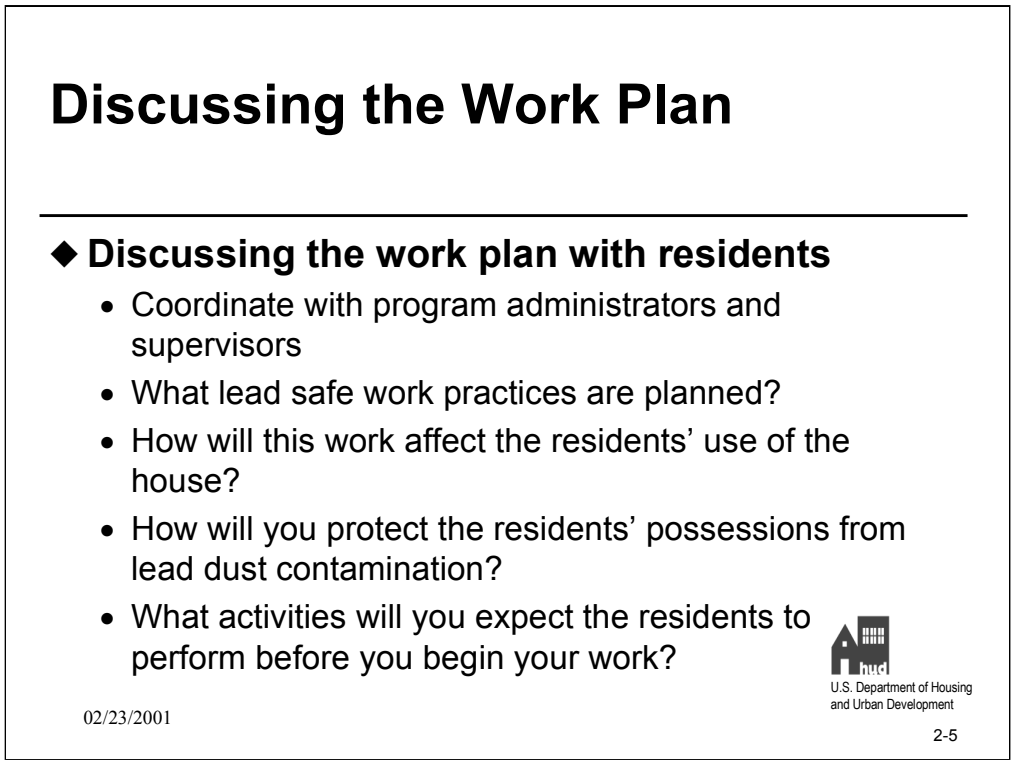


- In addition to any generic communication you have with residents during a renovation, remodeling, or rehabilitation job, they must be informed that your work has the potential to create lead dust. The EPA pamphlet *The Lead-Based Paint Pre-Renovation Rule* provides good pointers for talking to clients. The following topics should be discussed with the homeowner prior to beginning any renovation or remodeling job that has a potential to create lead dust:

Why are lead safe work practices a good idea?

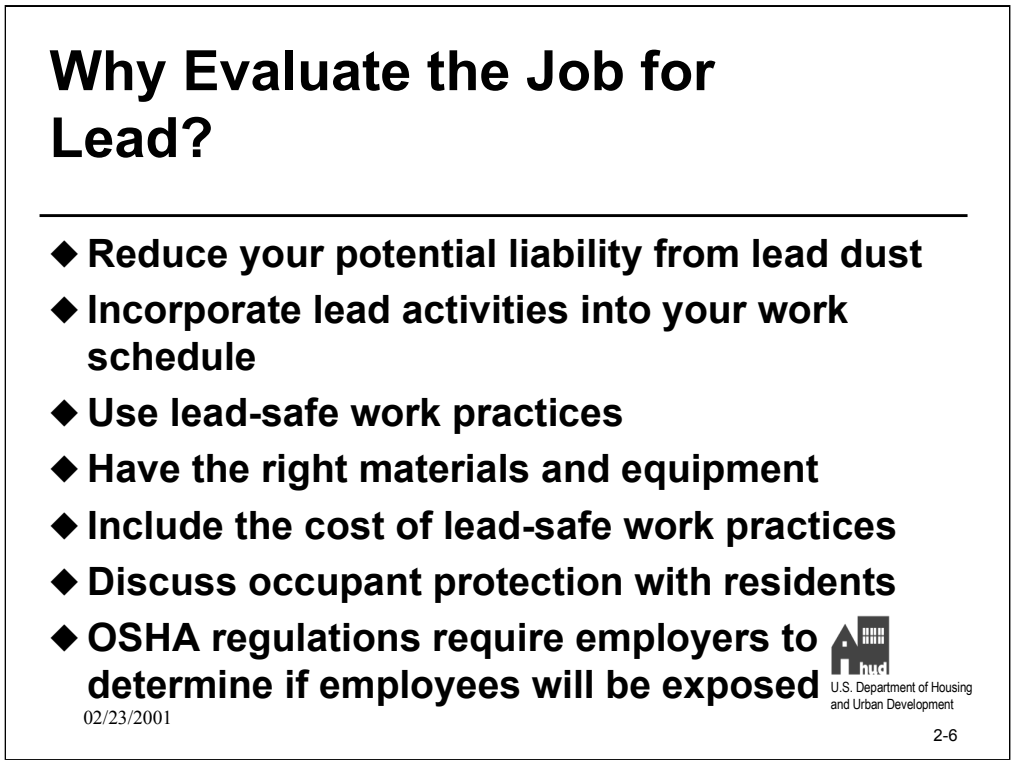
- Incorporating lead safe work practices into your renovation, remodeling, and rehabilitation activities will:
    - Protect children's and workers' health
    - Keep the house safe from increased levels of lead dust
    - Is an example of good professionalism

- Module 1 presented more detailed information on these topics. Also, you can refer to the *Lead Paint Safety Field Guide* in Appendix 1 or to EPA pamphlet *Protect Your Family From Lead in Your Home* in Appendix 3 for additional information.



Discussing the work plan with residents

- In addition to discussing the hazards associated with lead-based paint and and lead dust, you or your supervisor should review your plan for lead-safe work practices with the residents. This includes:
  - Describing how you will protect residents' possessions from further lead dust contamination
  - Identifying the activities you expect the residents to perform before you begin your work
- It is much easier to prevent possible problems during set-up than to do extra cleaning afterward. You may want to ask resident(s) to move some items before you begin your work. These include moving any furniture and fixtures out of the work area and storing them away from any work that may create dust. Seal over remaining items with polyethylene protective sheeting where possible. Moving items such as drapes, area rugs, and plants will reduce the potential for contaminating them with lead dust. If the paint in the work area is already deteriorated, you may suggest that the residents clean these items prior to moving them to other areas of the house to minimize the amount of lead dust that is distributed to other areas of the house. If the residents move and clean these items before the renovation work begins, you will not have to worry about being responsible for damaged or lost items.

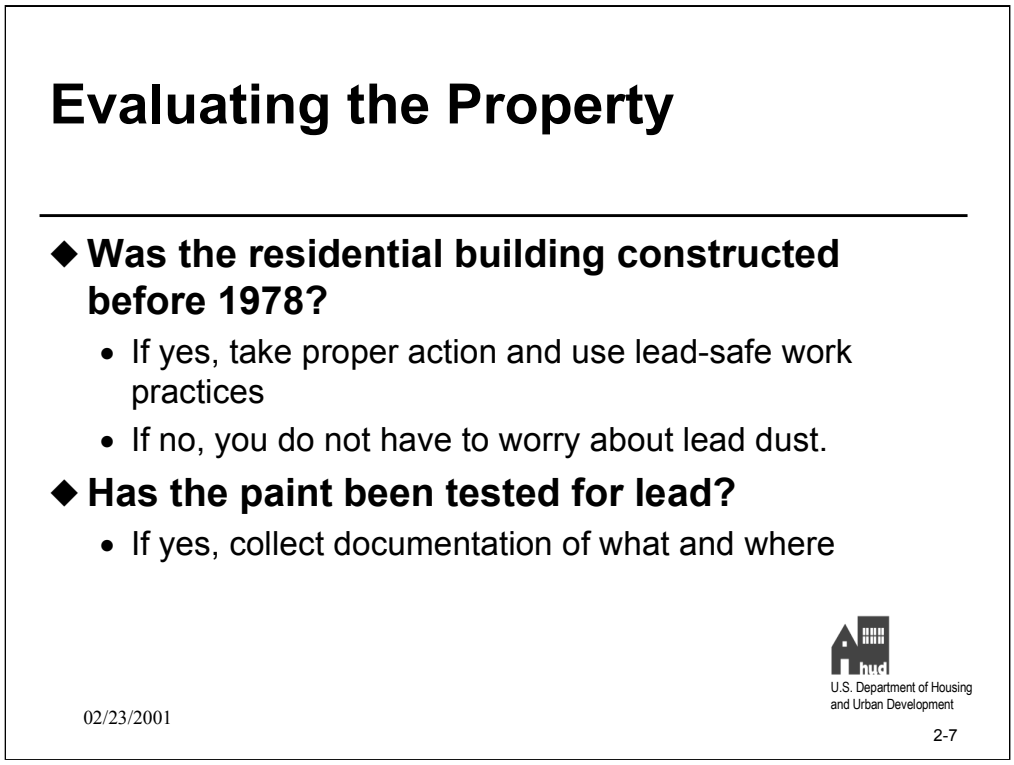


Why Evaluate Your Job

- There are a number of reasons why you should determine if your job will create lead dust prior to starting to work. These include:

  - Ensuring your activities will not create additional hazards or potential liabilities from lead dust.
  - Including lead dust control activities in your work schedule.
  - Using appropriate lead safe work practices.
  - Having materials and equipment on hand to safely manage lead dust, minimize the amount of dust created, and reduce the potential for spreading dust to other parts of the dwelling or surrounding area.
  - Accurately estimating the costs of the additional time, labor, and supplies needed to perform lead-safe work practices.
  - Making sure that this is a job you want to go into.
  - Developing a list of issues and preparing to discuss them with owners and occupants.

- It is a good idea to discuss lead-based paint, lead dust, and occupant protection with the residents before beginning the work. This allows you to sell this service to the residents and positively distinguish yourself from the competition.
- See the Field Guide pp. 11, 75, and 76.



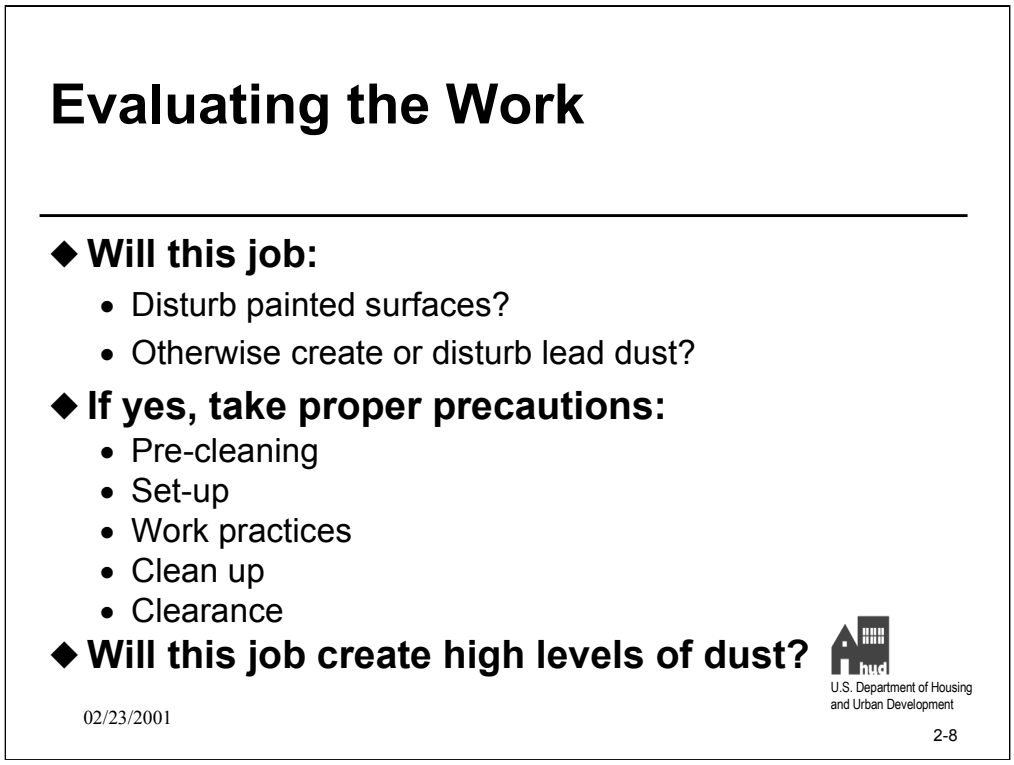
Was the property constructed prior to 1978?

- Many buildings constructed before 1978, especially those constructed prior to 1960, contain some lead-based paint. Unless otherwise documented, you should always assume that painted surfaces from pre-1978 houses include lead-based paint and that all dust generated from these surfaces may contain lead. Although the amount of lead-based paint found in homes varies, older dwellings typically contain higher concentrations of lead paint.

  - **What is the age of the property?** If the property was constructed after 1978, you do not need to worry about performing lead safe work practices. The resident should be your first source for this information. They can get information on the age of the property from tax records or property deeds.

  - **Has any prior renovation work been done?** If all of your work will be conducted in a dwelling constructed or renovated after 1978, you do not need to utilize lead-safe work practices, even if the rest of the property was built earlier. You should ask the owner for this information. If the owner does not know if or when renovation work was conducted, and the property was constructed prior to 1978, you should assume all paint surfaces contain lead-based paint.

  - **Has a lead evaluation been conducted (for federally funded properties)?** Lead evaluations cover a range of activities that test for lead-based paint. If the owner has documentation that an EPA or state certified inspector or risk assessor performed a lead evaluation and found that no lead-based paint is present in the work area, you do not have to utilize lead safe work practices, regardless of the age of the property.



Will the work disturb painted surfaces, or create / disturb dust that may contain lead?

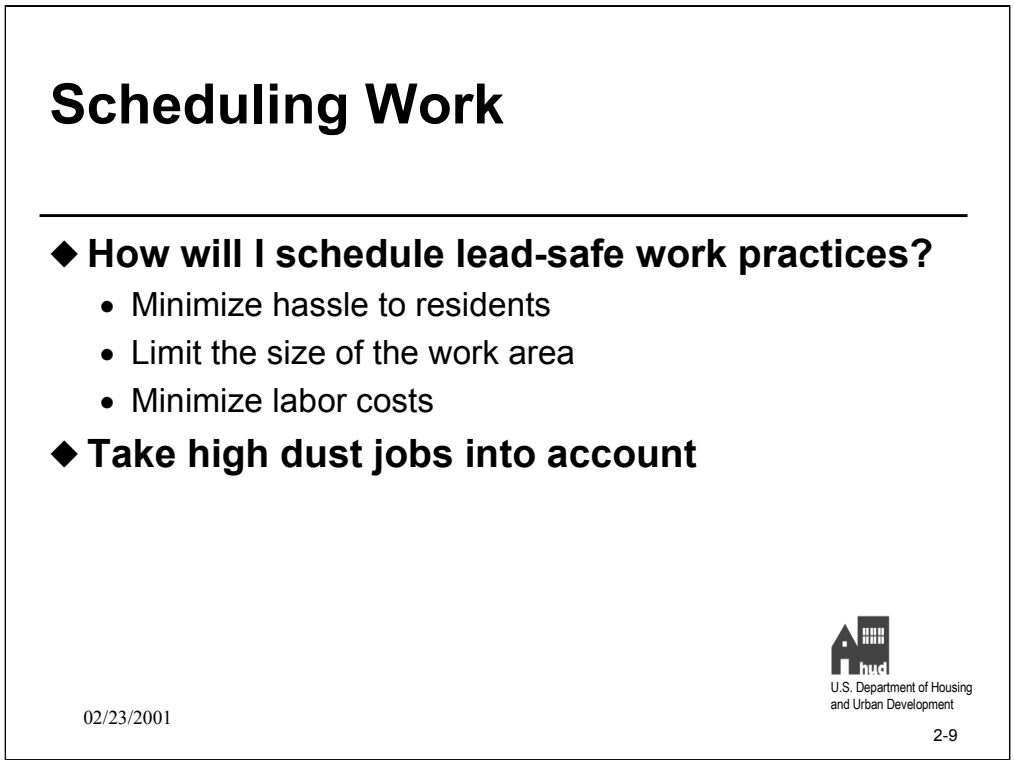
- All renovation, remodeling, and rehabilitation activities that disturb painted areas, including scraping paint, removing siding, replacing windows, will create some dust. Additionally, some areas, such as window troughs and loose areas near a building's foundation, typically accumulate dust and paint chips. You must consider these factors when approaching the job and develop an appropriate plan to deal with the potential lead dust. If your work will NOT disturb ANY painted surfaces or areas where lead dust can accumulate, you do not have to use lead-safe work practices.

What precautions are needed?

- The amount of dust created is directly related to the size of the work area, condition of the structure, and tools, materials, and dust control methods used. Later modules will present descriptions of the necessary precautions you should take while setting up the work areas, performing renovation, remodeling, or rehabilitation activities, and cleaning up.

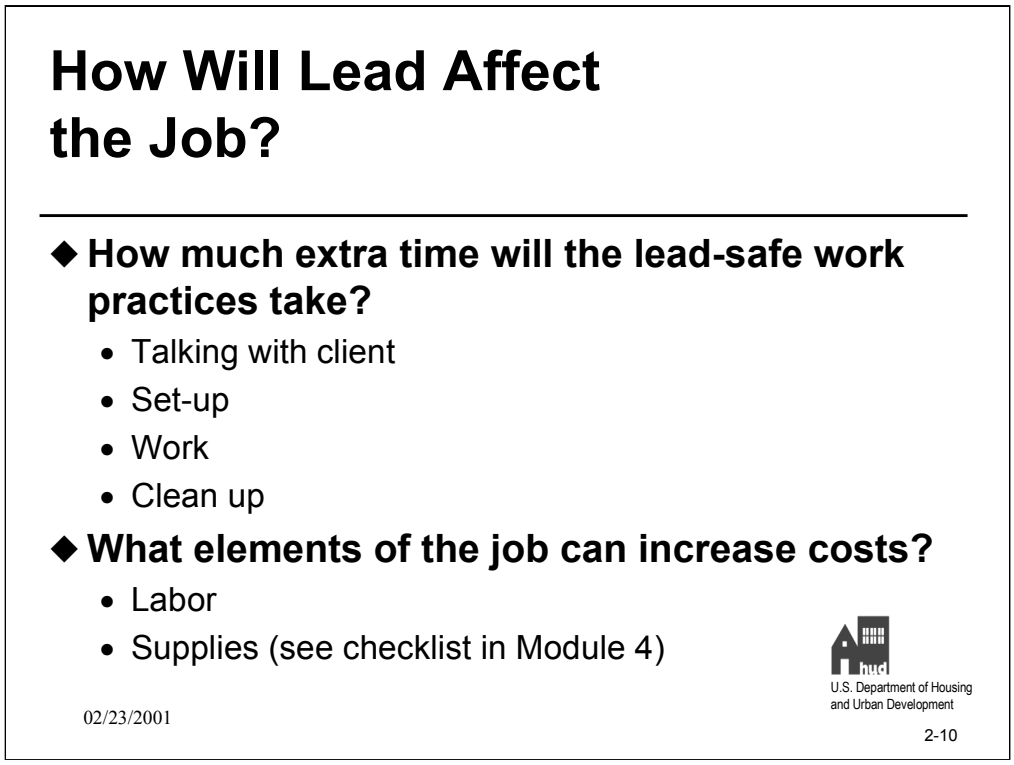
If the job will disturb paint surfaces, will it create high dust that will cause you to take extra precautions?

- Work, such as demolition, or removing old paneling, siding, windows, or wall-to-wall carpeting, can create high dust levels. Additionally, surfaces with deteriorated or chipped paint are more likely to generate high levels of dust than intact surfaces. The level of dust a job will create directly affects other parts of your job, including the materials and equipment required, precautions taken during set up, and the control methods used.



How will I schedule the lead safe work practices?

- When scheduling lead safe work practices, you should keep three goals in mind:
    - Minimize the hassle to the residents
    - Limit the size of the work area
    - Minimize extra labor costs
- In most cases, it is preferable to complete lead hazard control activities before beginning other renovation, remodeling, or rehabilitation activities. This will minimize the possibility of distributing lead dust outside of the work area. This may also allow most of your work to be done using traditional methods - without the precautions necessary when working with lead-based paint - thereby simplifying the coordination of other project-related activities. It would also minimize the hassle to the residents by reducing the areas of the house they should not enter because lead dust activities are taking place.
- For large projects, it may make more sense to conduct lead safe practices at the beginning of each phase of the project. For example, if you are renovating all of the bathrooms in a house, you may work in one bathroom at a time. In this case, it makes sense to perform lead-safe work practices at the beginning of each individual renovation activity as opposed to at the beginning of the entire job.



How will the lead activities affect my job?

How much extra time will the lead-safe work practices take?

- This question only applies to the portion of the renovation, remodeling, or rehabilitation job dealing with lead-safe work practices. These activities will affect both worker and resident access to areas of the house where the work is taking place. The length of time the lead-safe practices requires could significantly affect the scheduling of other activities throughout the house. It is important to estimate the extra time associated with each phase of the lead-safe work practices when you are planning the project and developing cost estimates. Talking with the client and educating the client about lead-safe practices will also take up time.

What are the extra costs?

- The cost of lead-safe work practices and lead dust control techniques will vary depending on the project's size, scope, and scheduling. You should consider the following factors when developing a cost estimate:
    - Extra labor costs associated with performing the activities
    - Extra supplies needed
- To ensure you have the necessary materials on hand at the beginning of a project, it is helpful to review the checklist of supplies and materials listed on the back of the worksheet in Module 4. This list includes supplies that will typically be used on all jobs as well as specialized materials and supplies that may be required only under unique circumstances. All of the materials and tools in this checklist will be discussed in later modules.

Module 3
Setting Up Your Workspace to Contain Lead Dust

U.S. Department of Housing and Urban Development

02/23/2001

3-1

Module 3 Overview

- **What is containment?**
- **High Dust Activities**
  - Hand scraping large areas
  - Demolition

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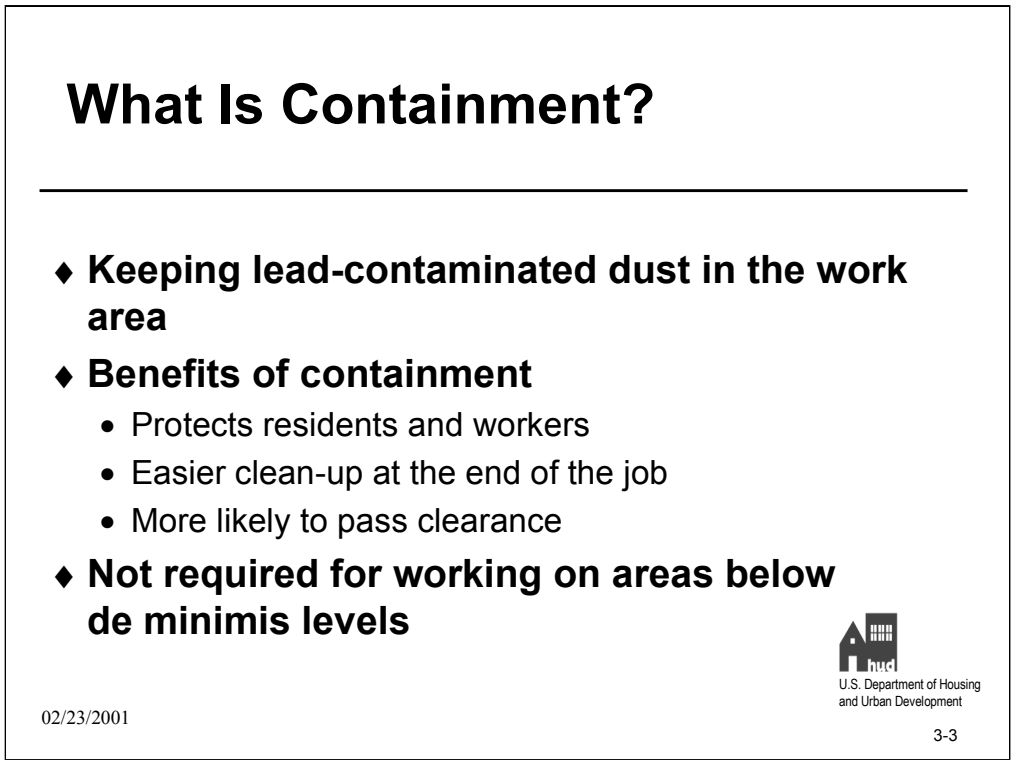
Upon completion of this module you will be able to:

- Perform set-up techniques to contain lead dust and allow for easier cleanup at the end of the day and at the completion of the job.
- Identify appropriate set-up techniques for high dust jobs that may require additional containment.

What is a high dust job or activity?

- A working definition of a **high dust job** is one with activities that creates dust and debris that will spread beyond five feet from the area that you are working on. Conversely, a **low dust job** is one in which dust and debris will not spread beyond five feet from the work area.
- In general, jobs that involve only a small work area create less dust than jobs that involve a larger work area. However, in addition to the size of the job, the work practices (e.g., sanding), and equipment (e.g., power sander) used will affect how much dust is created. So, for example, using a power sander without a HEPA filter vacuum attachment on a two square foot area could be considered a high dust job. Using power tools equipped with HEPA filtered vacuum attachments will create less dust than using power tools without these attachments.
- Examples of high dust activities include:
  - Hand scraping large areas - interior and exterior
  - Demolishing painted surfaces
  - Using circular or reciprocating saw*
  - Removing dry residue and paint after using chemical strippers*

** Allowed by HUD Rule **only** if done with lead safe work practices*



What is containment?

- **For purposes of this training, "containment" is** anything that stops lead-contaminated dust from spreading beyond the work area to non-work areas.
- In general, there are many degrees of containment, ranging from simple plastic sheeting on the floor surrounding a small work area to a fully sealed dust room (discussed later in this module). Some types of containment are more effective than other types. A reusable drop cloth is not effective because it can trap and hold dust and paint chips, and can transport lead-contaminated dust from one job site to another. It is not an effective form of containment for working in homes with lead-based paint.

Benefits of containment

- **Reduces the risk to you and residents**. Following the work area set-up suggestions of this module will protect you, your co-workers, and residents from the negative health effects of lead while remodeling, renovating, or rehabilitation. Reduced risk to you and co-workers is also dependent upon wearing proper personal protection equipment.
- **Easier clean-up.** The pre-work set-up process is essential to keeping lead contaminated dust within the work area where it can be easily cleaned. Proper containment of the work area helps to limit the areas you need to clean up after the job is complete. This saves time and money for cleanup.

De Minimis Levels

The HUD de minimis levels are:

- 20 square feet on exterior surfaces
- 2 square feet in any one interior room or space
- 10 percent of the total surface area on an interior or exterior type of component with a small surface area

Current Interior Set-Up Practices Spread Lead-Contaminated Dust

- **Reusable drop cloth**
- **Furniture in the room**
- **Open doors and windows**
- **Broom or shop vacuum**

Do not use on jobs where lead is present!

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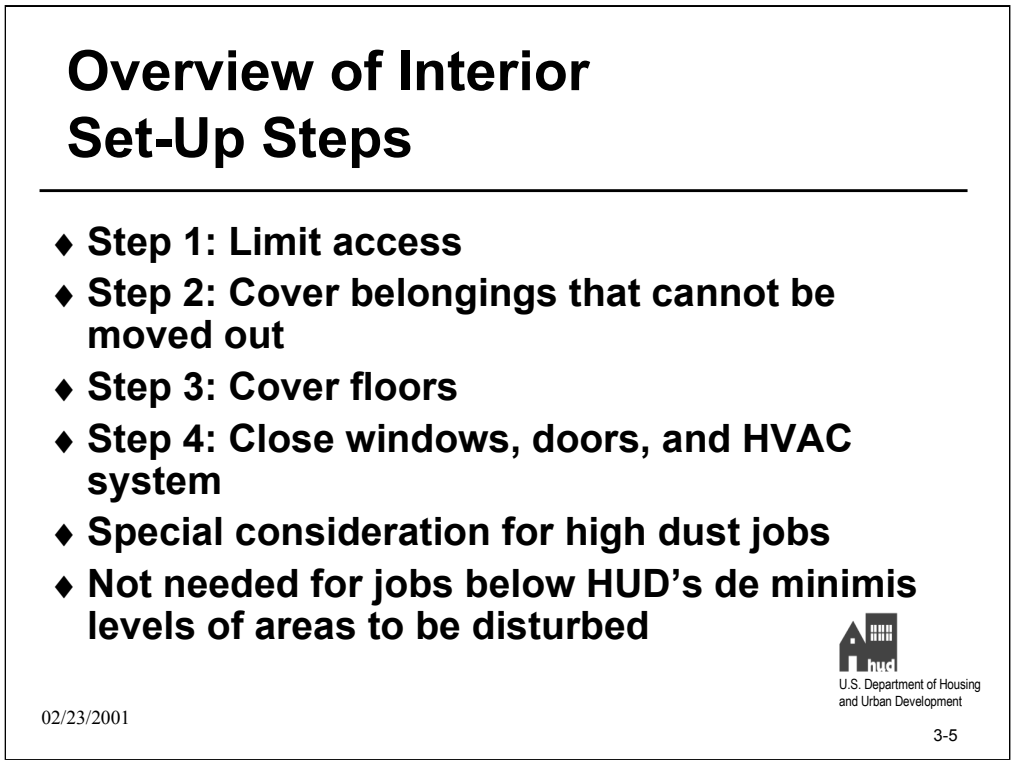
Current practice for interior set-up typically involves

- **A reusable drop cloth** is an improvement over not using any drop cloth, but it can carry dust from one job site to other job sites, and contaminate vehicles and storage areas. Some of the dust captured by a drop cloth falls to the floor when folding the cloth to carry away. However, some of the dust stays with the drop cloth. When it is used again it may contaminate the new (clean) job site with lead-contaminated dust.
- **Allowing furniture to remain in the work area** while the work is being performed. Lead-contaminated dust may fall and remain on these furnishings after the job is completed. Residents could easily come into contact with the lead-contaminated dust on the furnishings and get poisoned.
- **Allowing residents access to work area** while the work is underway. The residents are then exposed to the lead-contaminated dust and can track the dust to other parts of the building where it could linger. Again, residents could easily be exposed to the lead-contaminated dust on the furnishings and get poisoned.
- **Open windows and doors** allows lead dust to float into other parts of the building or over onto neighboring property.
- **Brooms and shop vacuums are typically used to clean-up.** Both clean-up methods capture some dust, but shop vacuums especially can put more dust into the air than they clean up if the filters are dirty or inadequate. Vigorous sweeping may also put a lot of dust into the air. To be effective, containment must be practiced even when cleaning up after the job.



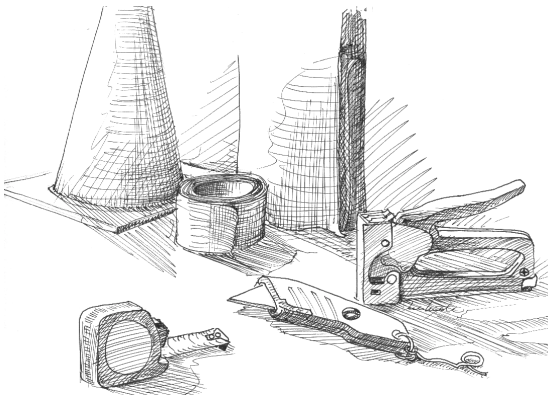
Overview of interior set-up steps

- Details for these steps are on the following several pages. These four steps will help contain lead dust to the work area for interior jobs.
- See page 13 in the *Lead Paint Safety Field Guide* for additional information. Appendix 1 contains a copy of the text from the *Lead Paint Safety Field Guide*.

The de minimis levels are:

- 20 square feet on exterior surfaces
- 2 square feet in any one interior room or space
- 10 percent of the total surface area on an interior or exterior type of component with a small surface area

Job Set-Up Toolkit



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Typical items for work area set-up to contain lead-contaminated dust:

Barriers, such as:

- Rope or other barrier
- Tape (bright color preferable)
- Saw horses
- Orange cones or other similar marker

Coverings for Unmovable Furniture, Fixtures, Plants or Out door Play areas:

- Duct tape, painters tape, or masking tape
- Stapler
- Heavy duty plastic sheeting, such as 4-6 mil plastic sheeting
- Utility knife or scissors
- Disposable mesh materials such as burlap, cheesecloth, or landscaping mesh

Other Set-Up Containment Items:

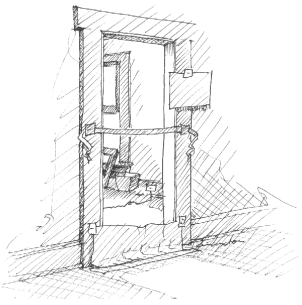
- Tack pad (sticky pad for walking on to remove dust from soles of shoes)
- Small disposable towels or wipes
- Misting bottle

Worker Protection (Required above the PEL):

- Coveralls, gloves (leather, cloth, plastic or rubber as appropriate), goggles
- Disposable shoe covers
- Appropriate respiratory protection
- Painters' hats

Interior Set-Up
Step 1: Limit Access

- **Instruct residents to stay away from work area**
- **Do not allow young children (under 6 years) or pets near work area**
- **Place a barrier or tape across entrances**
- **Do not allow eating, drinking, or smoking in the work area**



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Restrict access to the work area and ask residents to stay away while work is underway

- Restricting access to the work area will avoid unnecessary exposure of residents, especially children, to lead dust and minimize its spread to non work-areas.
- Tell the residents to stay away from the area as much as possible. Residents and pets coming and going can easily track lead-contaminated dust throughout the home and into areas that are not being worked on and therefore to areas that are unlikely to be cleaned up promptly.
- This is especially true for small children under six years old. Be sure to explain to residents that this is for their own protection and that small children are most at risk of health problems from exposure to lead.
- You may need to provide an indication of how long you will be working in a particular area so that residents can plan ahead to obtain items that they may need before you begin working.

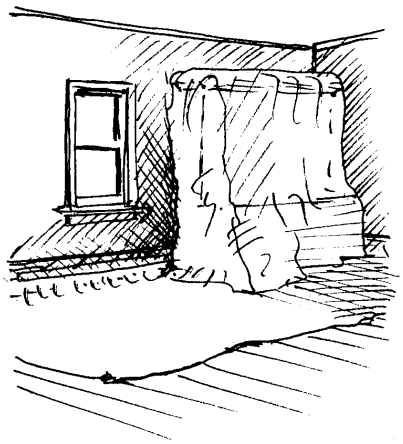
Place a barrier across entrances

- A physical barrier, such as a cone or masking tape, should be placed across doorways to remind residents to stay away, especially in buildings where more than one family lives. The barrier serves as a reminder to residents that they should not enter the work area, and also signals that the area has not yet been cleaned up.

Do not allow eating, drinking or smoking in the work area

- This is primarily a protection for workers, but is also important if residents are living in or near the work area. Post signs that prohibit eating, drinking, or smoking in the work area. Dust in the air can land on food or be breathed when smoking. If food is set on an unwashed surface, it can easily pick up lead-contaminated dust, which is swallowed when eating the food.

Interior Set-Up
Step 2: Cover Belongings



- **Cover furniture and objects in protective sheeting**
  - **Furniture**
  - **Carpet**
  - **Lamps, pictures, and other fixtures**

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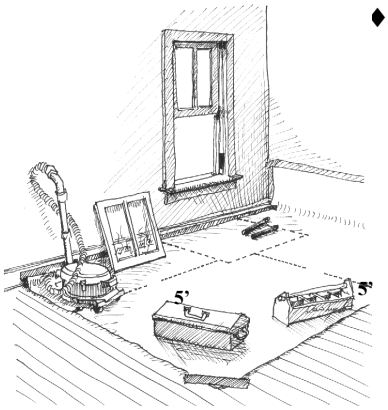
Cover furniture and other objects in the room with protective sheeting

- Cover all objects that were not removed from the room in protective sheeting. Completely cover all non-movable furniture, carpets, and other personal items with protective sheeting. Secure the protective sheeting to the floor with tape so that no dust can get onto the covered items.
- Heavy duty protective sheeting such as thick heavy duty plastic is commonly used in many rehabilitation jobs. Protective sheeting can be bought at many hardware stores.
- If it is a high-dust job, remove the furniture from the work area.

Interior Set-Up
Step 3: Cover Floors



- **Cover floors with protective sheeting**
  - **At least five feet on all sides of work area**
  - **2nd smaller layer if using chemical strippers**
  - **Place a tack pad at edge of protective sheeting, lay protective sheeting on frequently used walking paths to outdoors and bathrooms**

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Cover Floors

- Use protective sheeting to cover the floor. The protective sheeting should extend at least five feet to the left, right and front--and in some cases to the back--of the work area. It should be tightly secured to baseboard or flooring using duct tape, painters tape, or masking tape. The corner edge of the protective sheeting should be reinforced using duct tape or a staple.
- Use of a catch bag will assist in keeping dust and debris off of the floor and can increase efficiency of cleanup.
- A second smaller layer of protective sheeting should be used with chemical strippers. This second layer should be taped to the top of the first layer. Place the second layer immediately below the work area. This layer will capture any waste and aid in cleaning up.
- Tools that are used frequently should be left within the work area throughout the job to avoid tracking dust to non-covered areas.
- Consider covering shoes with removable booties, wiping off the tops and soles of shoes with a damp paper towel each time you step off the sheeting, or using a “tack pad” that removes dust from the soles of shoes. Immediately place used paper towels in a covered garbage bin. A tack pad can be found at most hardware stores or bought through a supply catalog; it is a sticky pad that you walk on to remove dust from the soles of your shoes. The tack pad can be taped to an outer corner of the sheeting.

  Note: If tack pads are not readily available to you, contact the National Lead Assessment and Abatement Council (NLAAC) at (800) 590-NLAC for information on where to get them.

Interior Set-Up
Step 4: Close Windows, Doors, HVAC

- **Close and seal windows and doors**
- **Close and seal HVAC vents**

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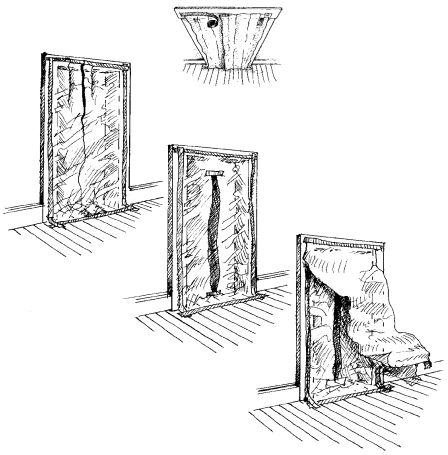
Close and cover windows and doors

- Close and seal windows (if no work is being done on the window) and doors, including closet and cabinet doors in the work area.

Close and seal HVAC vents

- Heating ventilating and air conditioning (HVAC) systems distribute air throughout the building and thus can allow dust to move to other rooms. Close and cover the HVAC vents in the work area to prevent air from blowing the dust out of the contained work area and to prevent dust from getting into the HVAC system.

Special Considerations for Interior High Dust Jobs



- **Remove furniture, fixtures and belongings from work area**
- **Cover door openings with 2 layers of protective sheeting to form an "airlock"**
- **Close and cover HVAC vents**

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Remove throw rugs, draperies, and furniture from the work area when completing a high dust job

- Before starting work, request that the homeowner remove furniture and fixtures from the room. This will prevent lead-contaminated dust from getting into these items.

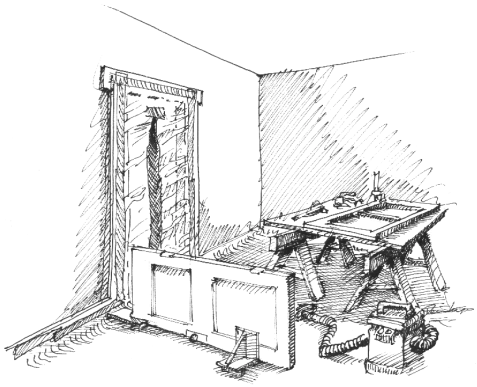
Cover door openings with 2 layers of protective sheeting

- Covering the door with this two-layer system will contain the dust within the work area. Follow the steps below:
  1)Cut first plastic sheeting layer slightly wider and longer (three inches) than door frame.
  2)Make small "s" fold at the top of sheeting and tape to top of door frame. Make a similar "s" fold at the bottom of the sheeting and tape to flooring. This will ensure that the plastic is not taut. Staple top corners for reinforcement.
  3)For exiting and entering the room, cut a long vertical slit in middle of protective sheeting; leave six inches at top and bottom uncut. Reinforce the top and bottom of the slit with tape to prevent the plastic from tearing.
  4)Tape a second layer of protective sheeting to top of door frame. This layer is cut slightly shorter than door frame so that it will hang down flat against the first sheet of plastic.
  5)Tape and staple top corners of second layer to door frame and first layer. Leave hanging over first layer.
- See Page 46 in the *Lead Paint Safety Field Guide* for more information on how to put the two layer system in place.

Close and seal HVAC vents in the room

- Turn off the HVAC system for work area. The vents should then be closed and covered with cardboard and protective plastic sheeting. After the work is complete the vent covers should be removed and washed.

Special Considerations For Interior High Dust Jobs



- **For work on removable objects that create lots of dust**
- **Select a room that can be easily closed off**
  - **Follow Steps 1 through 4 for interior set-up**
  - **Follow the procedures for high dust jobs**
- **Do the work off-site**

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Consider setting up a work room ("dust room") for high dust-generating work on components that can be moved out of their original room and into the dust room

- A dust room prevents the spread of lead-contaminated paint and dust to non-work areas and also makes clean-up easier.
- Use this technique for high dust activities, for example, planing and scraping doors or window sashes where you are maintaining the original windows.
- Set up a dust room if work is being done on components in a room that residents must have access to, such as the kitchen. Rather than keeping the resident out of the kitchen, remove the components to the separate dust room and complete surface preparation there. After preparation is complete, the components can be returned to the kitchen.

Select a room that can be easily closed off from the rest of the home to use as a dust room, or work off-site

- A dust room can be any room that can be closed off. Residents should not have to enter this space for the duration of the job. For example, a spare bedroom or other unused room that residents do not need to access during the time that the work is being performed.
- The dust room should be close to the work area, if possible.
- Follow the four set-up steps for all work with minor modifications or additions: 1) limit access, 2) remove furnishings, 3) cover the floor, 4) seal windows, doors, and HVAC vents.
- Workers should wear protective clothing, NIOSH approved respirators (e.g., N100), and safety goggles.
- Plan your work so that necessary supplies and equipment are in the room to minimize the number of trips outside the room while work is being performed.
- See Page 14 in the *Lead Paint Safety Field Guide* for more information.

Current Exterior Set-Up Practices Spread Lead-Contaminated Dust

- **Ground uncovered**
- **Reusable drop cloth**
- **Paint chips**
- **No barriers**
- **Windows and doors open**

These practices can poison children!

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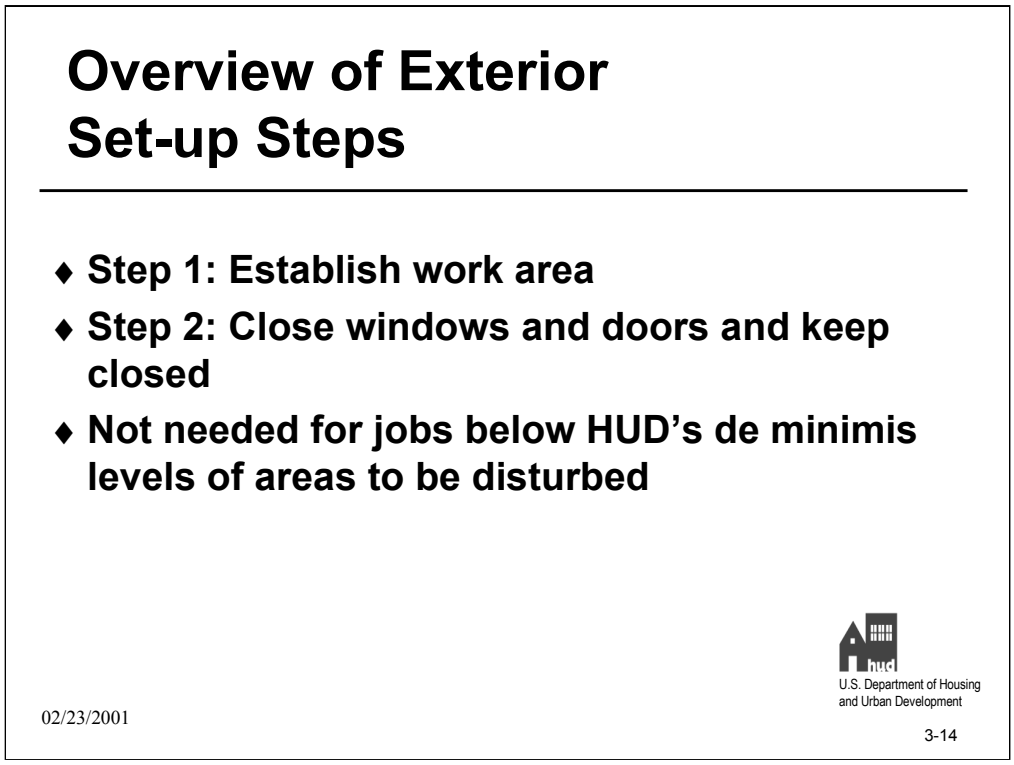
Current practices for exterior set-up

- **Leaving the ground uncovered** allows lead contaminated dust to get into the dirt, washed into storm drains, and into nearby play areas.
- **Covering with reusable drop cloth.** Similar to the problems associated with using a reusable drop cloth for interior jobs, a reusable drop cloth for exterior jobs can carry dust from one job site to other job sites. Some of the dust captured by a drop cloth falls to the floor when folding it to carry away. However, some of the dust stays with the drop cloth to the next work site, thus potentially spreading lead-contaminated dust to a new work site.
- **Small paint chips** and piles of dirt are often overlooked. This poses a considerable hazard to small children.
- **Residents and passers-by usually have unlimited access to area.** Similar to interior work, residents and passers-by may come into contact with lead-contaminated dust and breathe or swallow it.
- **Windows and doors are left open** and may allow lead contaminated dust to enter the house.



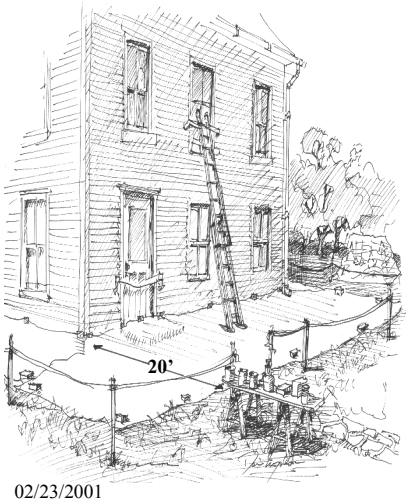
Two steps for exterior set-up to contain lead dust

- Details for these steps are on the following two pages. These two steps will help contain lead dust to the work area for exterior jobs.
- See page 22 in the *Lead Paint Safety Field Guide* for more information.

The de minimis levels are:

- 20 square feet on exterior surfaces
- 2 square feet in any one interior room or space
- 10 percent of the total surface area on an interior or exterior type of component with a small surface area

Exterior Set-Up
Step 1: Establish Work Area



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- **Cover the ground with protective sheeting**
  - **If space permits, extend at least 10 feet from work area**
  - **Cover nearby vegetable gardens and children's play areas**
- **Limit work area access**
  - **Establish a 20 foot perimeter around work area if space permits**

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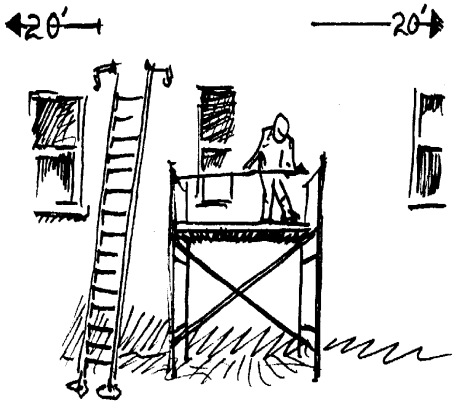
- **Cover the ground with protective sheeting** If space permits, lay protective sheeting on the ground below the work area to at least 10 feet from the house. This creates a visible work area and helps remind residents and passers-by that they should not enter the work area unless they have a compelling need. Note: Black plastic can kill plants.
- **An option for covering grass, shrubs, and gardens is a disposable mesh material** such as landscape fabric or burlap. Landscape fabric is an inexpensive plastic mesh that is often used by landscapers. It can be found in many plant nurseries or hardware stores. This covering will protect the soil and plants from lead contamination. Remember children often play in the dirt and may put their hands in their mouth while playing. Any dirt on their hands will go into their mouths and may be swallowed.
- **Remove toys and other items from work area** and cover all play areas including sandboxes.
- **Staple or tape the protective sheeting to the wall** of the building, or use a 2x4 to hold the material next to the wall. Use heavy objects (e.g., rocks) to weight the other edges of the protective sheeting to the ground so that it won't blow in the wind.
- **When using ladders on plastic sheeting** consider placing a sturdy piece of plywood on the plastic and then setting the ladder on the plywood. This will prevent the ladder from puncturing the plastic and also will provide a stable surface for the ladder.

Limit work area access

- Limit access to work area by placing orange cones, saw horses, or tape around a 20 foot perimeter of the work area. This will help to discourage residents and passersby from entering the work area.

Exterior Set-Up
Step 2: Close Windows &Doors



- **Close nearby doors and windows within 20 feet of the work area**

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Close and cover windows and doors

- All windows and doors within 20 feet work area should be closed to prevent dust from entering the home. Consider requesting that the neighbors also close their windows and doors.

MODULE 3 EXERCISE

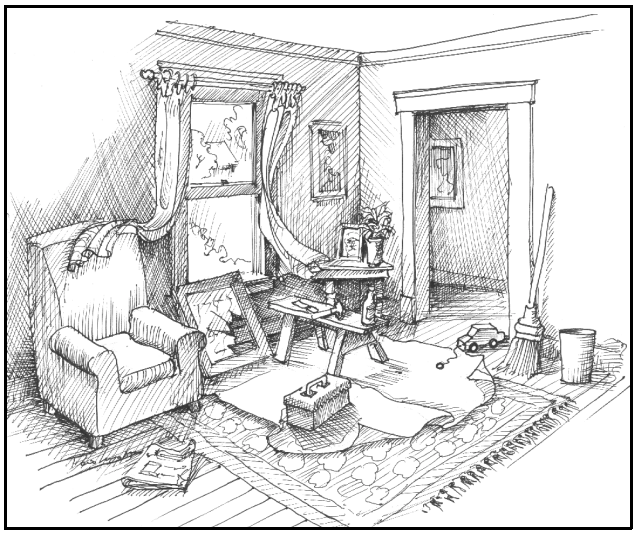
Objective: Review set-up methods to contain lead dust and allow for easier clean-up.

Length: 30 minutes, including discussion of answers

Directions: In groups of three or four take 20 minutes to review the three illustrations below and:

- Identify three set-up methods that encourage the *spread* of lead-contaminated dust and debris beyond the work area;
- Identify three techniques that could be used to *reduce* the spread of lead-contaminated dust and debris to non-work areas;
- Assign one person to report your group's answers to the rest of the class.

Illustration 1



Increase the Spread of Dust and Debris

Reduce the Spread of Dust and Debris

Illustration 1

MODULE 3 EXERCISE

Illustration 2

Increase the Spread of Dust and Debris

Reduce the Spread of Dust and Debris

Illustration 3

Increase the Spread of Dust and Debris

Decrease the Spread of Dust and Debris

Illustration 2

Illustration 3

Module 4
Safe Work Practices

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Module 4 Overview

- Prohibited Practices
- Safe work practices to perform work
- Tools and supplies you may need
- Basic steps to protect yourself
- Control the spread of dust
- Exercise
- Summary

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4-2

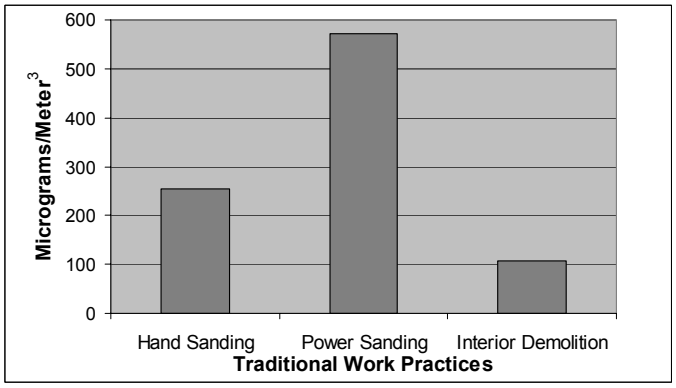
Role of safe work practices

- In addition to proper set-up at the start of a job and cleanup at the end of the job, the third key strategy to minimize the spread of dust is using safe work practices.

Upon completion of this module, you will know

- What work practices are prohibited because they create dangerous amounts of dust and paint chips.
- What safe work practices to use to reduce and control dust and paint chips.
- What tools you will need.
- How to apply safe work practices to common renovation, remodeling, and rehabilitation jobs.

Typical Lead Dust Creation



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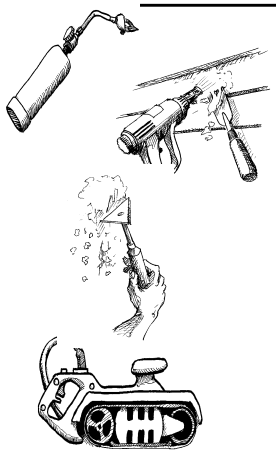
4-3

Traditional work practices may create large amounts of dust

- This chart shows amounts of airborne lead dust created by three common construction practices: hand sanding, power sanding, and interior demolition. Note all airborne dust eventually becomes settled dust.
- The amount of lead dust for each practice is significantly higher than the level where worker protection, such as respirators and protective clothing, is required by OSHA. This airborne dust is hard to control.
- By using safe work practices, you can control and significantly reduce the amount of dust created on the job. Controlling lead dust at the source of generation is important because dust generated into the air will eventually become settled dust on the ground. Later in this chapter, you will learn safe work practices that can replace these prohibited work practices.
- The data used in the chart above are from *Lead Exposure Associated with Renovation and Remodeling Activities: Summary Report*, Prepared by Battelle for the U.S. Environmental Protection Agency, May 1997, EPA 747-R-96-005.
- Conduct initial exposure assessment as required by OSHA lead construction standard. Information on conducting initial exposure assessments can be found in Appendix 6 or on the world-wide-web at www.osha.gov.

Practices Prohibited by HUD in Federally Owned and Assisted Housing



- **Open flame burning or torching**
- **Machine sanding, grinding, abrasive blasting, or sandblasting without HEPA exhaust**
- **Heat gun above 1,100 degrees Fahrenheit**
- **Extensive dry scraping and dry sanding**
- **Paint stripping in a poorly ventilated space using a volatile stripper that is a hazardous substance**

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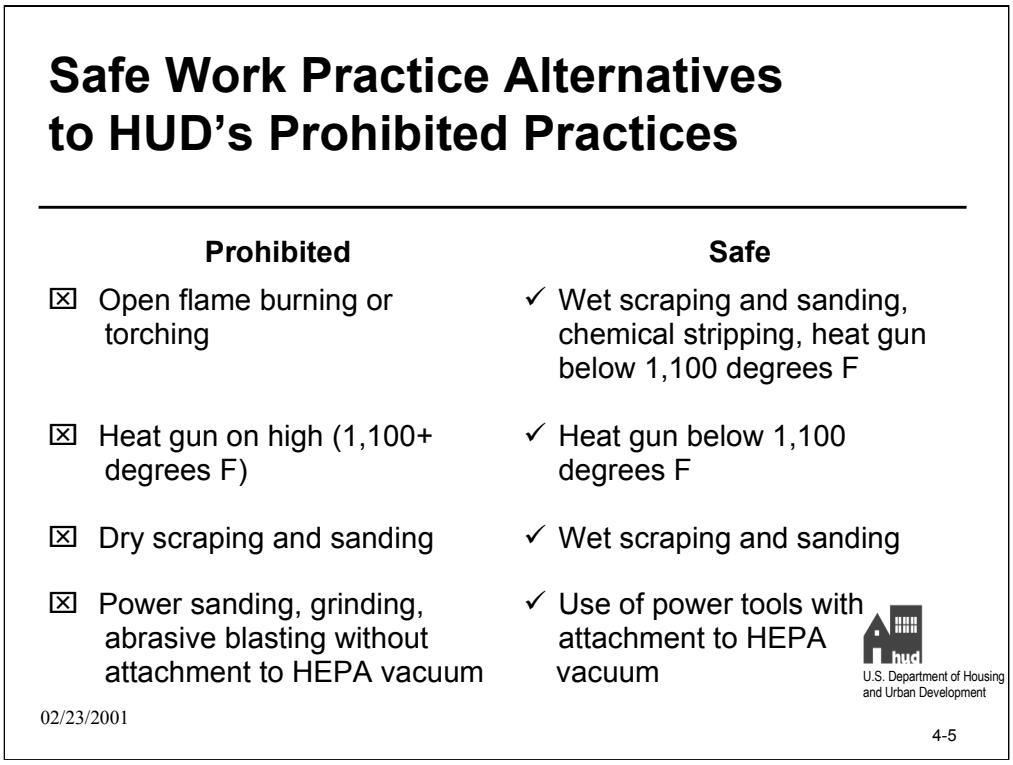
Do not use these traditional work practices:

- A key to minimizing the spread of dust and paint chips is to not use certain traditional work practices known to create large amounts of dust and debris.
  - **Open flame burning or torching of paint and using a heat gun above 1,100º F** create fumes that are dangerous for workers to breathe. Small lead particles created by burning and heating also settle on surrounding surfaces and are very hard to clean up.
  - **Machine sanding, grinding, abrasive blasting**, **or sandblasting without HEPA exhaust** even on a small surface, creates a large amount of leaded dust that floats in the air and then settles on surfaces inside and outside the work area.
  - **Heat gun above 1,100 degrees Fahrenheit** may generate lead fumes which are an inhalation hazard.
  - **Extensive dry hand sanding and hand scraping** can also create large amounts of dust and paint chips.
  - **Paint stripping** is not a common work practice during most types of renovation and remodeling activities.

- See pages 9-10 in the *Lead Paint Safety* Field Guide for more information about these practices.



Alternative safe work practices for each prohibited practice

- For both large and small paint removal jobs, there are safe work practice alternatives.
- Some possible alternatives are listed on the slide.
- With experience, you will determine which safe work practices work best for different tasks.

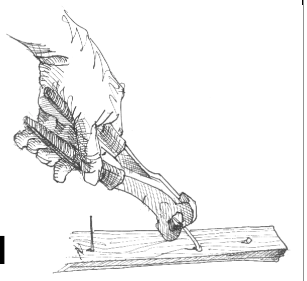
  Note: HEPA (high efficiency particulate air) vacuums have HEPA-rated filters that stop 99.97% of particles of 0.3 microns or larger.

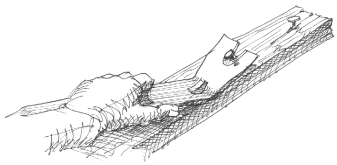
Also keep in mind

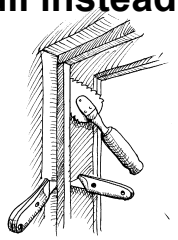
- Chemical strippers can be dangerous and should be used with great caution. Some can cause burns. Methylene chloride is suspected to cause cancer. Types of strippers range from citrus-based (safer) to more dangerous caustic strippers. Use of chemical strippers may trigger additional training, notification, and record keeping requirements under the OSHA Hazard Communication Standard. Follow the manufacturer's directions when using any chemical stripper.
- If building components to be stripped can be removed, such as doors, consider having them stripped off-site at a paint stripping facility.
- Half-face negative-pressure respirators do not provide sufficient breathing protection when using methylene chloride strippers.
- See pages 9-10 in the *Lead Paint Safety Field Guide* for more information.

More Safe Work Practices

- **Mist before drilling and cutting (hand tools only)**
- **Score paint**
- **Minimize pounding and hammering -- pry and pull instead**
- **Mist surroundings**







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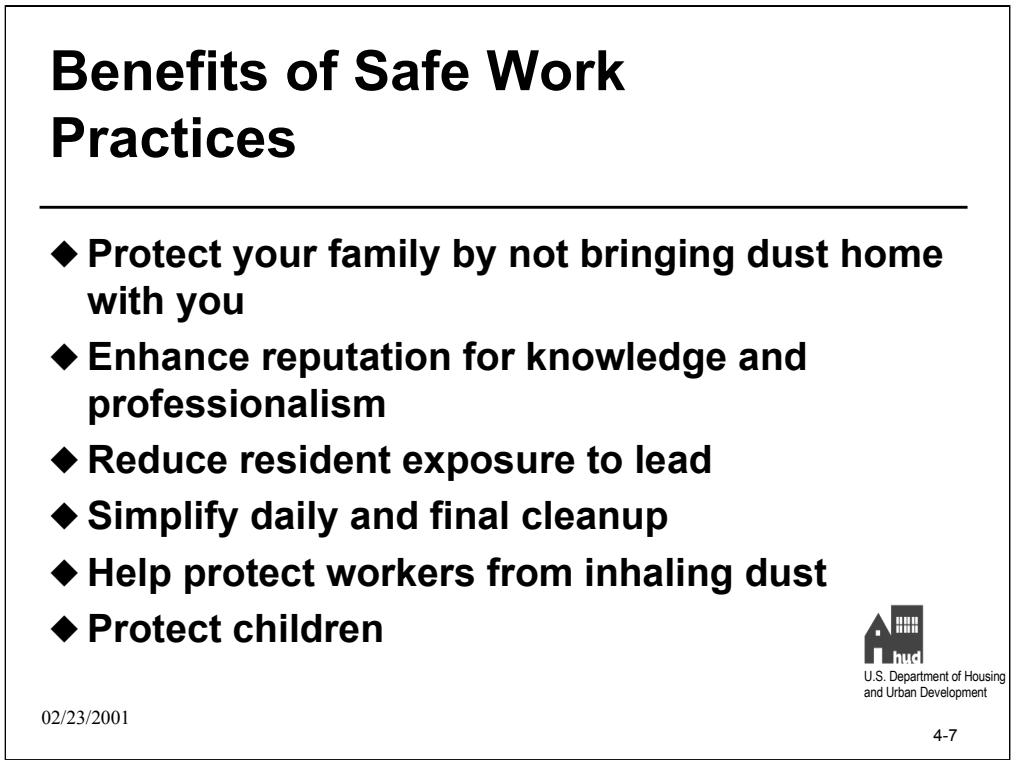
Additional safe work practices

- Mist before drilling and cutting to reduce dust creation and keep dust from becoming airborne and spreading beyond the work area.
- Scoring paint before separating components helps prevent paint from chipping when a paint seal is broken.
- Prying and pulling apart components and pulling nails instead of pounding create less dust and fewer paint chips. Vise grips may be useful when pulling nails.
- Frequent misting of surrounding surfaces with water helps keep dust and paint chips from becoming airborne when disturbed by work activity.
- When employing wet methods, employees must be extremely careful to avoid electrical shock and electrocution hazards.
- Using power tools on heavily misted surfaces can be dangerous. Tool blades can slip and water can cause electric shock. When misting, lightly mist the surface and use hand tools only. If power tools are to be used, they should be attached to a HEPA vacuum.
- Ground fault circuit interrupters (GFCIs) must be used when working around sources of electricity to prevent electric shock injuries. Use of water around **live** electrical outlets is prohibited.
- Consider use of foam (such as shaving cream) when cutting or drilling to reduce dust generation.
- HUD's Lead Safe Housing Rule contains an exemption for wet methods when working within one foot of an electrical outlet.



Advantages for contractors

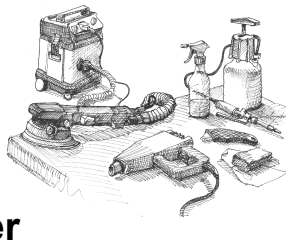
- In addition to being safer for residents, safe work practices have advantages for contractors and workers.

By effectively using safe work practices, you can

- Foster your reputation as an informed and professional contractor who recognizes the risks of lead-based paint and takes steps to help ensure resident and worker safety.
- Gain a reputation for leaving the job site cleaner than when you arrived.
- Help your customers feel safe and reduce their anxiety about the risks of renovation, remodeling, and rehabilitation work.
- Have less dust and debris to clean up at the end of the job.
- Reduce risk of taking leaded dust home to your family.

Safe Work Practices Toolkit: Tools, Equipment, and Supplies

- Wet/dry sandpaper, sanding sponge (block)
- Mist bottle, pump sprayer
- Tape (painter's, duct, masking)
- Heavy duty plastic sheeting, such as 4-6 mil
- Chemical stripper
- Garbage bags and duct tape
- Utility knife
- Heat gun
- Vacuum with HEPA filter



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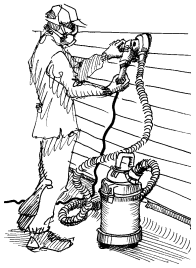
Safe work practices toolkit tools, equipment, and supplies

- There are some basic low-cost tools that you will need for safe work practices. Most of these tools and supplies are widely available from suppliers and home improvement stores.
- These tools are used to help reduce dust and for cleaning while working to keep dust under control.
- You will need several basic supplies to protect floor and ground surfaces, and bag, wrap, and clean dust as work is performed. If dust and debris are contained in plastic right after they are created, there is less chance that they will be spread beyond the work site.
- More toolkit supplies are listed on the next three pages of this manual.
- See pages 75-76 Tool and Supply List in the *Lead Paint Safety* Field Guide for more information.

HEPA (high efficiency particulate air) filters are able to filter very small particles--to be considered a HEPA filter, it must be able to filter 99.97% of microscopic particles.

Safe Work Practices Toolkit: HEPA-Filtered Power Tools

- **Large jobs may require special tools**
  - Power sanders, grinders, planers, shavers with HEPA filter vacuum attachment
  - These tools increase productivity



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HEPA equipment for power tools

- Because wet methods are appropriate and practical only when using hand tools, adapters and HEPA vacuums are necessary for power tools.
- These tools use HEPA vacuums and adapters that help contain dust and debris as they are created. A shroud helps to contain the dust and paint chips as they are created. They are carried to a HEPA vacuum by a hose attached to the shroud. Use of these tools increases productivity.
- It may be possible to rent these tools, if you decide to not invest in them.
- Use tools in accordance with manufacturer's recommendations and lead safe work practices.

Power washing

- Power washing can be used if runoff is properly contained and disposed.

Set-up is still important

- Proper set-up and cleanup is still important because HEPA attachments do not eliminate the possibility that work will spread dust. Nonetheless, these attachments will reduce dust levels and thereby shorten cleaning time and lower costs.
- See pages 75-76 Tool and Supply List in the *Lead Paint Safety* Field Guide for more information.

Protect Yourself

- **Workers should wear**
  - Painter's hat -- helps keep dust out of hair
  - Disposable or washable coveralls
    - Can be reused if not ripped
    - Launder separately
  - Disposable N-100-rated respirator (dusty jobs)
  - Gloves (during certain tasks, *i.e. High Dust Jobs*)
- **Wash face and hands frequently**
  - Helps to reduce hand-to-mouth ingestion of lead dust
- **OSHA may require more protection**

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Workers should protect themselves

- **Minimum steps** that workers can take to protect themselves include:
  - **Painter's hats** are an inexpensive way to keep dust and paint chips out of workers' hair. Painter's hats can be easily disposed of at the end of the day or job.
  - **Disposable coveralls** are a good way to keep dust off of workers clothes and reduce the chances for carrying dust to other areas of the residence as workers come and go. The coveralls can be removed when workers leave the work site and stored in a plastic bag overnight. To keep costs down, consider buying extra large size coveralls in bulk and sizing to fit workers with duct tape. Some coveralls have a hood to keep dust out of hair.
  - **Respiratory protection.** Workers should wear respiratory protection, such as an N100 disposable respirator, to prevent them from breathing leaded dust.
  - **Workers should wash** their hands and faces periodically to avoid ingesting leaded dust. It is especially important to wash well before eating, drinking or smoking and to not do any of these in the work site. Some of the dust that settles on the face around the mouth invariably finds its way into the mouth. Workers should also wash at the end of the day before getting in their car or going home. They can take leaded dust home to their families.

- OSHA rules require employers to take further steps to protect the health of workers on the job based on their exposure to lead. See slides on OSHA requirements.

- See page 17 in the *Lead Paint Safety Field Guide* for more information on worker protection.

Safe Work Practices Toolkit: Tools, Equipment, and Supplies

- Disposable hand towels
- Pre-moistened disposable wipes
- Painter's hats
- Gloves
- Coveralls
- Disposable booties
- N-100-rated disposable respirators where appropriate

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Safe work practices toolkit tools, supplies and equipment for personal protection

- Disposable hand towels (such as paper towels) and pre-moistened wipes have multiple uses on the job. They can be used to quickly clean surfaces and by workers to wipe dust before leaving the work site and washing before eating, smoking, or drinking.
- "N100" is a NIOSH rating for respirators. Respirators with an N100 (or HEPA) rating are approved for use when working on lead-based paint surfaces. OSHA requires different types of respirator rated for use around lead if exposures are high.
- All of the items on this list are readily available at hardware and home improvement stores. N100 disposable respirators cost approximately $6-7.
- See pages 75-76 Tool and Supply List in the *Lead Paint Safety Field Guide* for more information.

Control the Spread of Dust

- **When you leave the work area**
  - Remove booties
  - HEPA vacuum or wipe shoes - use tack mat
  - Remove coveralls or HEPA vacuum clothes
- **At the end of the day, don't take lead home to your family on your clothes or in your car**
  - HEPA vacuum clothes, shoes
  - Change your clothes and dispose or place in plastic bag to wash separately from household laundry
  - Wash hands, face
  - Shower as soon as you get home

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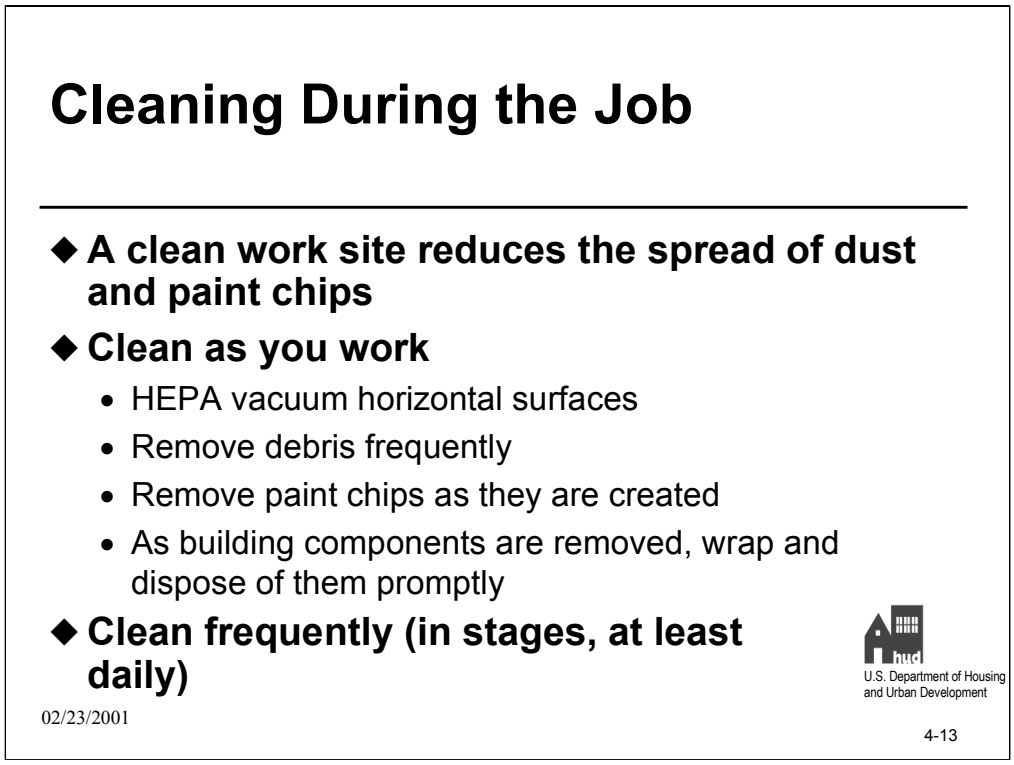
Precautions to take when leaving the work site

- When you leave the work site (the area covered by protective sheeting or the room), take precautions to prevent spreading dust and paint chips to other parts of the residence on your clothes and shoes.
- Every time you leave the work site, wipe or vacuum your shoes before you step off of the plastic sheeting. A large tack pad on the floor can help to clean the soles of your shoes. Remove booties if you are using them.
- At the end of the day, change your clothes and wash yourself to reduce the risk of contaminating your car and taking leaded dust home to your family.
- Before leaving the worksite-- remove any protective clothing, HEPA vacuum (no shop vacs) dust from non-protective clothing, and thoroughly wash your hands and face. Throw away disposable clothing or place clothing in a plastic bag to stop dust from getting on other clothes at home.
- At home-- as soon as you arrive at home, take a shower and be sure to thoroughly wash your hair, especially before playing with children. Wash work clothes separately from regular household laundry to stop lead particles from getting on your other clothes.



Clean the work site frequently

- Cleaning the work site frequently as the job progresses will reduce the spread of dust and paint chips. The cleaning need not be as thorough as the final cleanup. It should, however, keep debris, dust, and paint chips from piling up and spreading beyond the immediate work site.

Cleanup during the job includes

- **Removing debris frequently.** During demolition jobs, seal and dispose of construction debris as it is created.
- **Vacuuming horizontal surfaces frequently.** HEPA vacuum dust and paint chips that settle on surfaces, including protective sheeting. As workers come and go during the work day, this debris is easily spread. Periodic cleaning throughout the work day will help to minimize workers tracking dust. **DO NOT USE NON-HEPA FILTERED VACUUMS OR DRY SWEEPING FOR CLEANUP.**
- **Collect paint chips as they are created.** When removing paint, piles of paint chips can also spread outside the immediate work area as workers come and go from the work site. To keep paint chips from spreading beyond the work site, make sure that they are collected as they are created. Also, periodically HEPA vacuum or wet sweep and dispose of paint chips.
- **Wrapping and disposing of removed components.** When removing painted components such as windows, trim, and cabinets, wrap them in plastic sheeting and dispose of them in stages. This will prevent the spread of debris and keep residents, especially children, from coming into contact with leaded dust created by work.
- **How often should cleaning during the job take place?** The goal is to keep dust and debris under control, not to maintain a completely spotless site at all times. Every job is different, so clean when it makes sense to without hindering progress. Remove large amounts of dust, paint chips, and debris frequently, at least daily.

Exercise

- **Objective - Exercise A**
  - Evaluate a scenario
  - Plan Activities
- **Objective - Exercise B**
  - Evaluate a scenario
  - Identify potential activities that create dust
  - Identify steps you can take to minimize dust, and
  - Talk to clients about the potential lead dangers from the work
- **Use checklist**

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MODULE 4 EXERCISE 4A

Objective: Identify safe work practices for typical renovation, remodeling, and rehabilitation tasks.

Length: Total time: 25 minutes

Directions: Take 5 minutes to read the background and the jobs below. When you are finished, the instructor will ask you and the other students to contribute approaches to each of the jobs listed below. You may take notes on approaches under each description.

Background:

You have been asked to plan renovation work on a Victorian style home built around 1910. You are looking forward to doing a lead-safe, high quality job and getting a good reference. This represents at least three solid weeks of work for your workers. To be safe, you have advised the owners that you assume some layers of paint are lead-based paint. You reassure them that you will take steps to reduce the risk of creating a lead hazard.

The Jobs

How will you approach each of the following jobs in a lead safe way?

1. Remove worn green carpet from vestibule, first floor hallway, and staircase. The carpet is tacked to the floor and its edges are covered with quarter round at all of the walls. The carpet is being removed to expose hardwood flooring which is to be refinished.

2. Enlarge the door size opening in the wall between the living and dining rooms to make way for an enlarged passageway. There is trim at the base of the walls and trim at the top and sides of the opening. As much of the trim as possible should be saved to be reused on the enlarged opening. The new opening will be as tall as before but wider.

MODULE 4 EXERCISE 4A

3. Remove the old painted wooden cabinets in the kitchen. These built-in cabinets line two walls in the kitchen. The walls will be repainted and new cabinets installed.

4. Remove sections of deteriorated siding and peeling paint from the east exterior wall of the house. Water has leaked behind the siding causing large sections to deteriorate. There are two large patches of peeling paint where the siding is still solid. New clapboard siding will be installed later and the entire exterior repainted by a painting contractor.

MODULE 4 EXERCISE 4B

Objectives: The objective of this exercise is fourfold:

- To evaluate a project's potential to create lead dust and plan your work to minimize the creation and dispersion of this dust.
- To familiarize yourself with the worksheets included in this module and use them to evaluate a potential scenario.
- To discuss ways to talk to clients about lead safe work practices and ensure they are informed about the dangers of lead dust.
- To ensure you understand your requirements related to disseminating information related to lead-based paint.

Length: Total Time: 35 minutes - 20 minutes working in groups and 15 minutes discussion

Directions: The following exercise presents a scenario that may be similar to situations routinely encountered by you or your company. In groups of three to five (depending on class size), take the next 20 minutes to read over the scenario and answer the questions on the next two pages. Before answering the questions, however, complete the attached worksheet. If you need to make assumptions in order to complete the questions or the worksheet, please be sure to write down your assumptions and include them in your worksheet and answers.

Background

New property owners have contracted with your company to perform major remodeling work throughout a house constructed in the 1950's. On the main floor, the work consists of remodeling the kitchen (existing dimensions are 12' x 15') and adding a new 15' x 15' sunroom off of the kitchen. This remodeling work includes tearing out existing cabinets, flooring, and a painted wall. Upstairs, the residents have asked you to renovate the half-bath by removing the existing linoleum flooring and sink (porcelain sink attached to the wall with plumbing beneath exposed) and then laying new floor tiles and installing a new sink and cabinet unit. To the best of the residents' knowledge, no major renovation, remodeling and rehabilitation work has been done on the house since it was constructed and the former residents never mentioned lead-based paint.

Although the house is currently vacant, the new owners are planning on moving into the house in the very near future. It is highly likely that they will move in before all of the renovation work has been completed. The new owners are a couple in their early thirties with two children under the age of six, and two pet cats that are kept indoors.

MODULE 4 EXERCISE 4B

Complete the attached worksheet based on the information provided in the scenario. After completing the worksheet, answer the following questions. At the end of the exercise, you may be asked to share your answers with the class. Be prepared to explain your answers.

1. Was the property constructed prior to 1978 and do you have to utilize lead safe work practices?

2. Is this a high dust job? If yes, what work activities are likely to create high dust levels? What special precautions should you take to minimize the hazards associated with high levels of lead dust?

3. How would you schedule the work? When would you perform lead safe work practices in relation to the other renovation, remodeling, and rehabilitation work? Why?

MODULE 4 EXERCISE 4B

4. How did you develop your cost and labor estimates? Will any special tools or equipment be needed for this job?

The following questions pertain to talking to the residents.

5. What topics, related to lead dust and lead safe work practices, should you highlight when discussing the job with the residents? Where could you refer the residents if they ask for additional information?

6. After discussing the potential lead dust hazards and the associated lead safe work practices with the residents, they insist that these actions are not necessary because the house does not contain any lead-based paint. How do you respond?

WORKSHEET: EVALUATING THE JOB

1. Was the property constructed prior to 1978? or, If the work area is limited to an addition, was the addition constructed prior to 1978?	Yes_____ No_____
✔ If no, you are <u>not</u> required to perform lead safe work practices.	Yes_____ No_____
✔ Do you have documentation that the work area has been designed as lead-free by a certified inspector or risk assessor?	Yes_____ No_____
2. Will this work disturb painted surfaces or otherwise create or disturb dust that may contain lead?	
✔ Is this a high dust job? If yes, you must take added precautions.	Yes_____ No_____
3. How will the lead activities affect my job?	
✔ How much additional time will lead-safe work practices take? See calculation aid on back.	Set up _____hours Work _____ hours
✔ How much will these practices cost? See checklist of tools and materials on back	Cleanup _____hours Labor $ _____ Supplies $ _____
4. What activities should the residents perform before I begin my lead-safe work practices?	
✔ Examples include removing draperies, small furniture, and other fixtures from the work area.	Talk to the resident about specific activities

5. Other job related notes

_____

_____

CHECKLIST: MATERIALS AND SUPPLIES

Set up and Basic Tools

- ❑ Protective clothing, coveralls
- ❑ Disposable shoe covers
- ❑ N100 Dust Mask
- ❑ Painter's hats
- ❑ Paint scraper
- ❑ Duct or masking tape
- ❑ 4-6 mm polyethylene sheeting
- ❑ Utility knife
- ❑ Rope or other barrier
- ❑ Misting bottle
- ❑ Chemical stripper (avoid methylene chloride)
- ❑ Window opening tool
- ❑ Plane
- ❑ Heat gun
- ❑ Disposable hand towels

Specialized Tools - Hepa Filters

- ❑ Needle gun with HEPA exhaust
- ❑ HEPA exhaust attachments for power tools (sanders, grinders, planers, shavers)
- ❑ Power washing equipment

Clean up Supplies

- ❑ Two-sided bucket
- ❑ 3-4 disposable mop heads and mop handle
- ❑ HEPA filtered vacuum
- ❑ Misting bottle
- ❑ General or lead-specific Cleaning solution
- ❑ Disposable hand towels
- ❑ Heavy-duty garbage bags
- ❑ Duct-tape
- ❑ Shovel and rake

Hours and Cost Calculation

	Set up	Work	Clean up	Total
Labor Hours (total)				
Labor Cost (total)	**$**	**$**	**$**	**$**
Supplies	**$**	**$**	**$**	**$**
Total	**$**	**$**	**$**	**$**

RESOURCES FOR ADDITIONAL INFORMATION

Where can I get copies of the *Protect Your Family From Lead in You Home* pamphlet?

Download electronic copies at: www.epa.gov/lead

- ✔ Use camera-ready copies from the National Lead Information Center to reproduce the pamphlet, providing that you reproduce the text and graphics in full: 1-(800) 424-LEAD (5323).
- ✔ Order bulk copies from the Government Printing Office (GPO) which cost $26.00 for a package of 50 pamphlets: (202) 512-1800; refer to the pamphlet by name or by GPO Stock Number 055-000-00507-9.

Where can I get copies of *The Lead-Based Paint Pre-Renovation Education Rule* handbook?

Download electronic copies of the interim edition (June 1999) in PDF format at http://www.epa.gov/opptintr/lead/interior2.pdf

- ✔ Contact the National Lead Information Center at: 1-(800) 424-LEAD (5323)

Where can I find additional information and resources related to lead-based paint?

- ✔ National Lead Information Center: 1-800-424-LEAD (5323)
- ✔ EPA's Office of Pollution Prevention and Toxics (OPPT): www.epa.gov/lead, 202-260-3810
- ✔ HUD's Office of Healthy Homes and Lead Hazard Control: www.hud.gov/offices/lead, 202-755-1785, ext. 104.

Summary

- **Class discussion**
  - List key safe work practices and equipment

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Module 5
Clean-Up and Check Your Work

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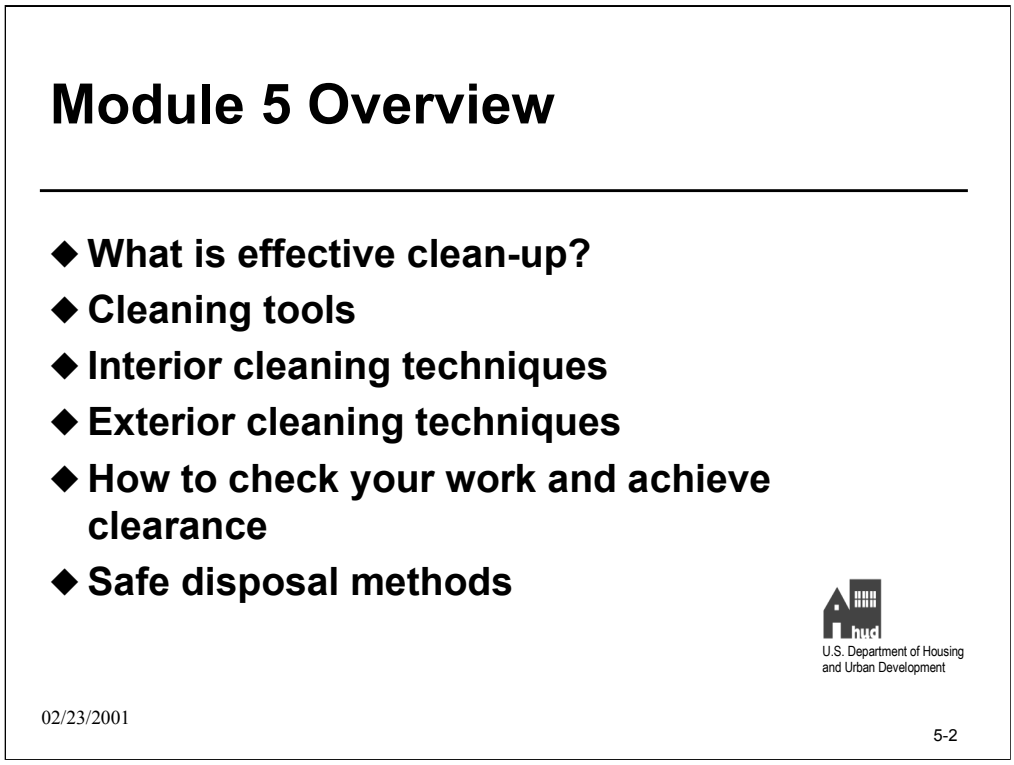
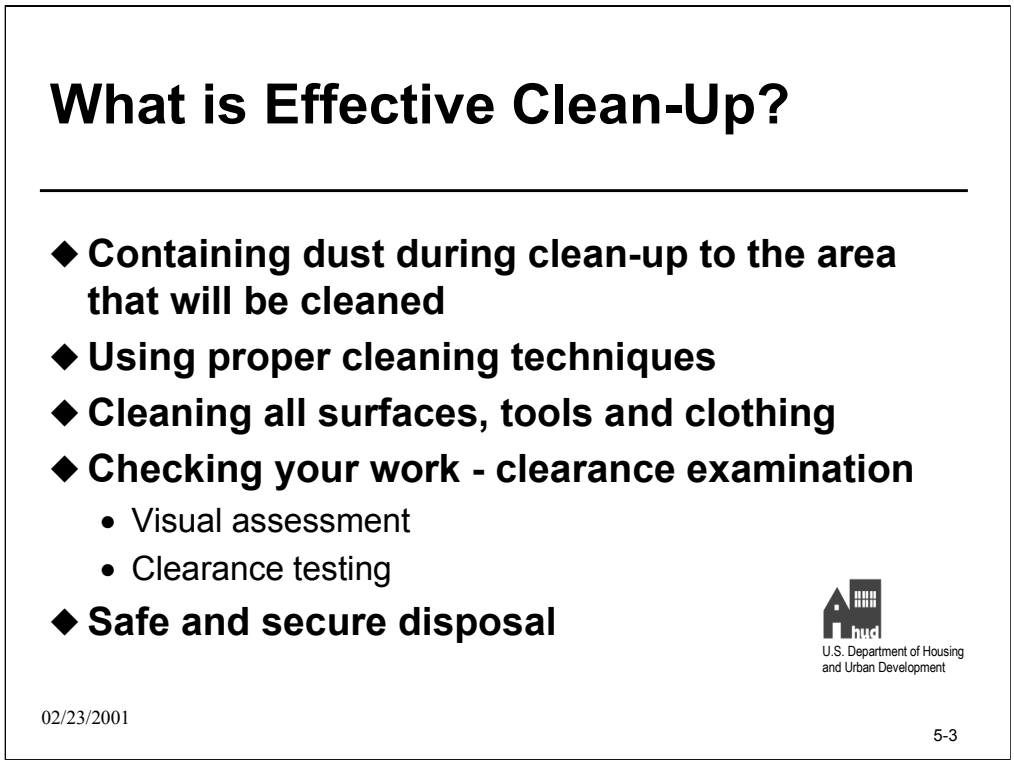


What you will learn in this module

In this module, we will cover all the topics listed on the slide above.

- The goal of clean-up is to leave the work area as clean or cleaner than when you arrived so that, as a result of your work, lead dust is not left behind to poison the residents of the home.
  - At the end of this module, you will know how to check your work to ensure the work area is clean enough to pass a clearance examination. See Appendix 2 for a discussion of HUD requirements, which include clearance examination.
- By using the techniques described in the following pages of this module you will be able to clean a work area quickly and efficiently. Remember, approaching a clean-up is similar to approaching a job. Proper preparation and planning will help make your cleaning efforts more effective and faster.
- Always schedule time at the end of each day to clean thoroughly.



Containment

- Effective cleaning begins with proper preparation and containment. Clean-up will be much easier and efficient if proper containment has kept all dust and debris confined to the work area. Also, containing dust to the area that is being cleaned is important.

Proper cleaning techniques

- You should be careful not to spread dust and contaminate other areas while cleaning. Using the techniques outlined in this module and following the proper sequence will help ensure that you do not contaminate other areas while cleaning.

Cleaning all surfaces

- "All surfaces" includes vertical surfaces such as walls and windows and horizontal surfaces such as floors, door tops, window troughs, and window sills. Cleaning should proceed from high to low, i.e., from top of wall to window to floor.

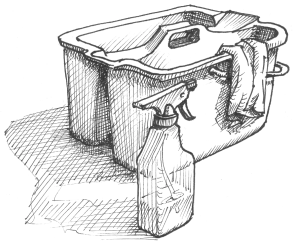
Checking your work

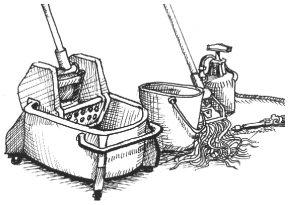
- Always conduct a visual inspection after any job. Look for any visible paint chips, dust or debris.
- A trained individual (sampling/clearance technician, LBP inspector or risk assessor) who did not do the work will perform the clearance examination. Check state requirements for acceptability of "sampling technicians" performing this activity.

Safe and secure disposal

- Bag and "gooseneck seal" all waste in heavy duty plastic bags such as 4-6 mil poly-bags. Safely dispose of all waste in accordance with state and federal regulations.

Clean-Up Toolkit





- Vacuum with HEPA filter
- Misting bottle and pump sprayer
- Mop with disposable heads
- Detergent
- Two buckets or two-sided bucket
- Disposable hand towels
- Heavy duty garbage bags
- Duct tape
- Shovel and rake

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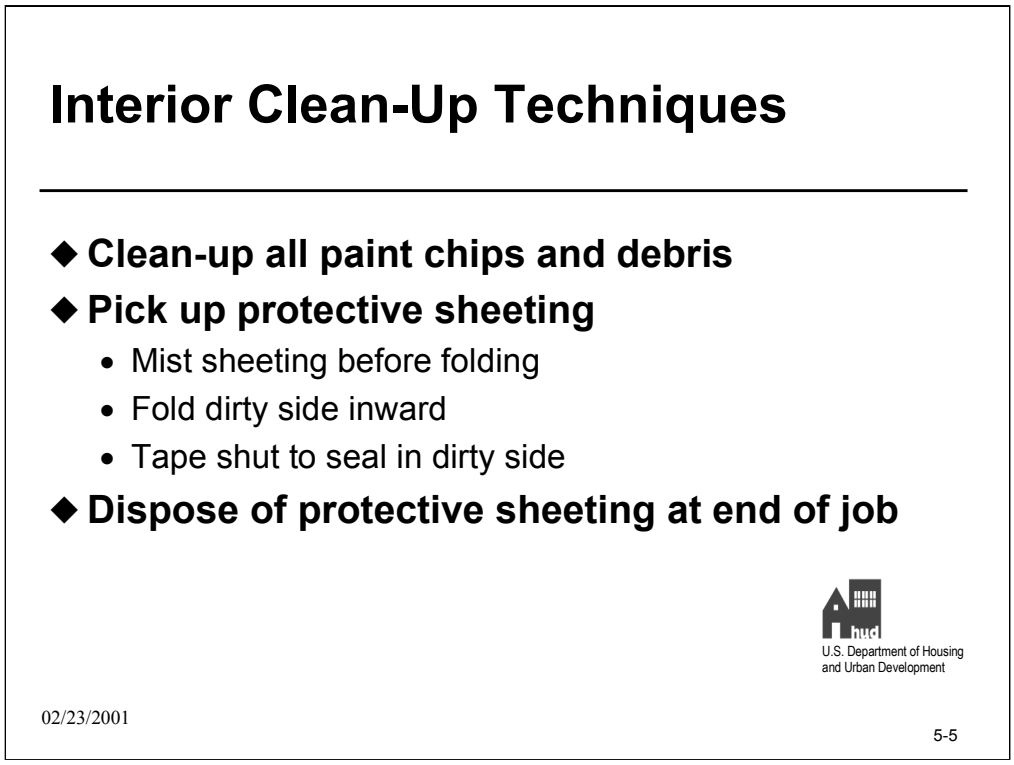
Clean-Up Toolkit

- The tools listed on the slide above are for cleaning interior and exterior jobs. Some tools, such as the pump sprayer, shovel, and rake are used primarily for exterior clean-up. Other tools, such as the buckets and mops are used primarily for interior clean-up.
- The following pages discuss clean-up for both interior and exterior situations.
- These items supplement the Job Set-Up (slide 3-6) and Safe Work Practices (slide 4-8) Toolkits.



Pick up

- Always begin a clean-up by picking up all paint chips and any visible debris with a wet disposable cloth.

Protective sheeting

- Protective sheeting may be used again within the same work area if it has not already been folded (see pp. 47, Lead Paint Safety Field Guide). When the job is complete, clean protective sheeting using a HEPA vacuum. Protective sheeting should then be folded and taped shut. Always fold dirty side inwards, seal and place in heavy duty plastic bags such as 4-6 mil poly-bag. "Gooseneck-seal" the poly-bag and dispose with the rest of your waste at the end of the job.

Interior Clean-Up Techniques

- **HEPA Vac work area from high to low**
  - **Start with walls, tops of doors, window troughs**
  - **HEPA Vac at least two feet beyond contained area**
- **Wet clean from high to low**
  - **Change cloths and rinse water often**
  - **Clean the floor last**
- **Clearance testing at end of job**

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HEPA vacuum the <u>contained</u> work area from high to low

- Start with the walls, tops of doors, and window troughs (high) and work your way down to the floor (low).
- Clean walls with a HEPA vacuum or by lightly wiping with a damp disposable cloth.
- **Be thorough-don't rush.**

When cleaning wet, you can either mist the surface with cleaning solution or use a wet disposable cloth

- Work from high surfaces to low. If a surface is very dirty use a moist paper towel before beginning to scrub with a wet cloth.
- Replace cloths and change rinse water often.

Clean the floor last

- Work toward door
- Mist floor and clean with a wet mop using cleaning solution and the two-sided bucket.
- Clean at least two feet beyond contained area.
- Then, repeat the process using a new mop head and clean water.
- Remember, always keep one side of the bucket for cleaning solution and the other side for rinsing and wringing out the cloth or mop-head. Change the rinsing water often.

It may be necessary to repeat the HEPA Vacuum and Wet Clean. <u>Always</u> clean to clearance.

Interior Checking Your Work

- **Conduct a visual inspection after cleaning**
  - Focus on child access areas such as floors, window troughs, window sills
  - Look for paint chips, dust, debris, and deteriorated paint
  - Inspect beyond work area
  - Repeat clean-up steps if necessary
- **Clearance testing at end of job ensures property is now safe for children**
  - Required when work is above de minimis levels in federally-assisted housing.
  - If area fails clearance, re-clean and retest.

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Clearance Testing has two parts:

Visual inspection (HUD refers to this as "visual assessment")

- A thorough visual inspection should be the first step of checking your clean-up. Any visible paint chips, dust or debris should be collected and disposed.
- **Visual inspection will not verify that a work area has been cleaned adequately**. In many instances lead dust is not visible to the naked eye and will be not be detected during a visual inspection. To ensure that a work area is properly cleaned, follow the practices outlined in this section and take dust wipe samples using a qualified person to conduct clearance.

Dust sampling

- Dust sampling can be performed to check the effectiveness of the clean-up efforts.
- In some cases, such as with federally assisted work or under some state and local laws, dust sampling may be required as part of "clearance" (a defined process to ensure that a work area is not contaminated with lead dust after work is completed). In such cases, dust sampling must be performed by a certified or trained person. Supervisors should be aware of state laws regarding renovation, remodeling, and rehabilitation work and clearance testing.

The de minimis levels are:

- 20 square feet on exterior surfaces
- 2 square feet in any one interior room or space
- 10 percent of the total surface area on an interior or exterior type of component with a small surface area

Exterior Clean-Up Techniques

- **For high-dust jobs mist area to keep dust down**
- **Visually inspect work area**
  - **Look for dust, debris, and paint chips**
  - **Focus on child access areas such as:**
    - **Window sills**
    - **Bare soil and ground**
    - **Play areas**

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High-dust jobs

- After completing a high-dust job, such as power sanding a painted surface, mist the entire work area to keep dust from spreading.

Visual inspection

- A thorough visual inspection of the work area should be conducted after any exterior job. Any visible paint chips, wood chips or other debris from the work area should be collected and disposed with the rest of your waste.
- Focus your visual inspection on areas where children may play or be exposed to lead contaminated dust or debris. Such areas include exterior porches, outside play areas, bare soil and ground, and window sills.

Remember

- Lead contaminated soil can poison children.
- Avoid dry raking and spreading dust.

Exterior Clean-Up Techniques

- **Pick up protective sheeting**
  - Collect and dispose of any debris or chips on sheeting
  - HEPA vacuum sheeting
  - Clean sheeting until it passes visual inspection
  - Dispose of sheeting properly
- **Visually inspect beyond work area**

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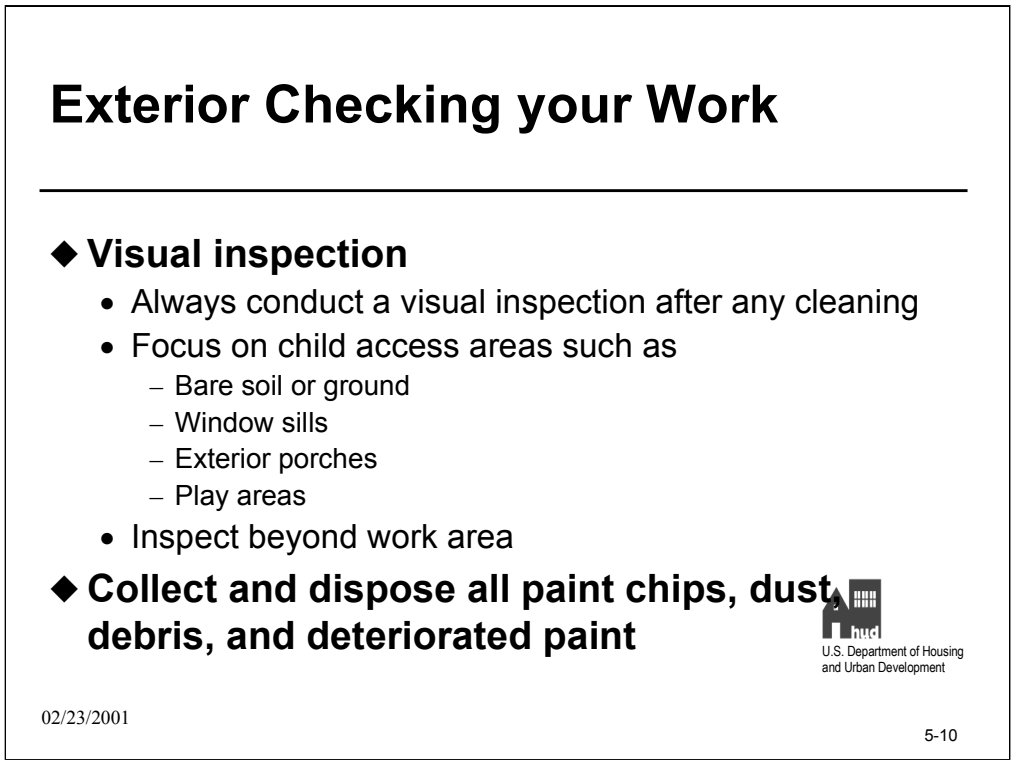
Protective sheeting

- If protective sheeting or landscape fabric will be disposed at the end of the job, it should be cleaned and disposed with the rest of your waste.

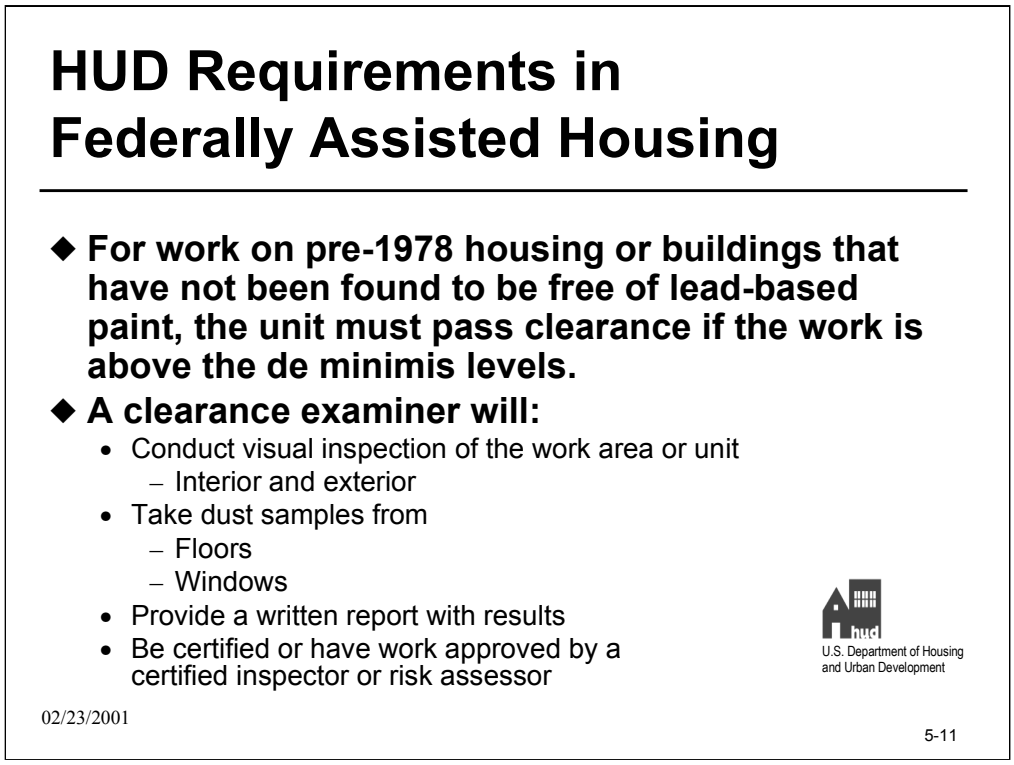
Specific exterior jobs

- If work takes place on an exterior porch or stairwell, HEPA vacuuming, wet cleaning and mopping, in addition to a thorough visual inspection, should be used to clean the work area. For such jobs the clean-up can be similar to clean-up after interior jobs. Collect and dispose of any dust or debris with the rest of your waste.



Checking your work

- A thorough visual inspection is the main part of checking your clean-up after an exterior job. You should collect and dispose of any visible paint chips, wood chips and debris found during the visual inspection. Child access areas include porches, play areas, bare soil or ground, and window sills.
- You may notice that the processes of clean-up and checking your work are similar for exterior jobs. A visual inspection is conducted once while cleaning and **again** after completing clean-up to check your work. Both visual inspections should be thorough and focus on collecting and disposing all visible paint chips, dust and debris.



Clearance

- Clearance is required in pre-1978 housing that has received HUD assistance and has not been found to be free of lead-based paint by an EPA or State certified risk assessor or inspector. In these cases, clearance must be conducted by an independent, certified clearance examiner or a trained technician. This person may be called a "sampling technician" or "clearance technician." Certified inspectors or risk assessors may also perform clearance examinations. Individual state requirements may vary, therefore, check state requirements to determine who may perform clearance testing.
- Clearance involves
  - A visual inspection to identify remaining deteriorated paint, dust, debris, and paint chips.
  - Dust sampling on floors and windows.
  - A written report with the results of the clearance examination.
- A unit or property that does not pass clearance must be recleaned and go through clearance again.
- The HUD rule is summarized in Appendix 2.

Disposal

- **What should I do with my waste?**
- **At the work site**
  - **Place waste in heavy duty plastic bags such as 4-6 mil poly-bag**
  - **"Gooseneck Seal" the bag with duct tape**
  - **Carefully dispose of waste in accordance with state and federal regulations**
  - **Store waste in secure area.**

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At the work site

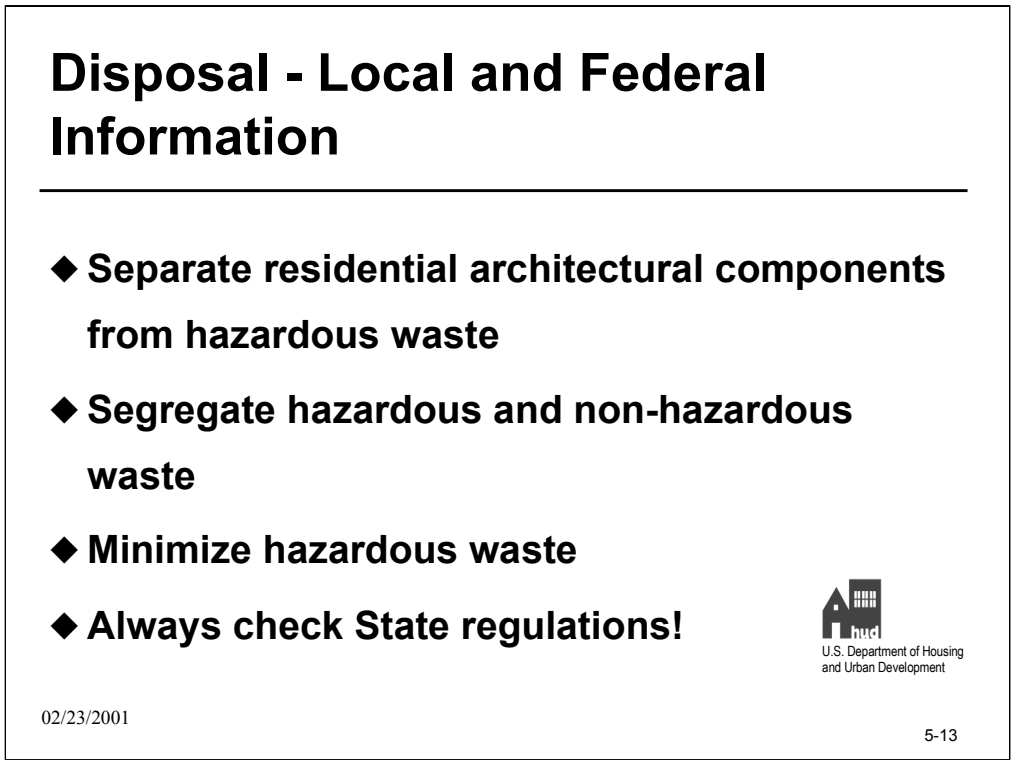
- Always collect, bag and seal your waste at the work site and in the work area. Do not carry your waste to another room or another area before bagging and sealing the waste. Store all waste in a secure container or dumpster until disposal. Limit on-site storage time. Avoid transporting waste in an open truck. Some examples of waste include:
  - Protective sheeting
  - HEPA filters
  - All paint chips, dust and dirty water
  - Used cloths, wipes and mop heads
  - Any debris
  - Protective clothing, respirators, gloves
  - Architectural components

Waste water

- Water used for clean-up should be filtered and dumped in a toilet. Never dump this water down a sink, storm drain, on the ground, or in a tub. **Always be aware of state and local regulations regarding waste water disposal.**

Remember

- If needed, "double-bag" your waste to help prevent the waste from escaping if the bag is cut or ripped.

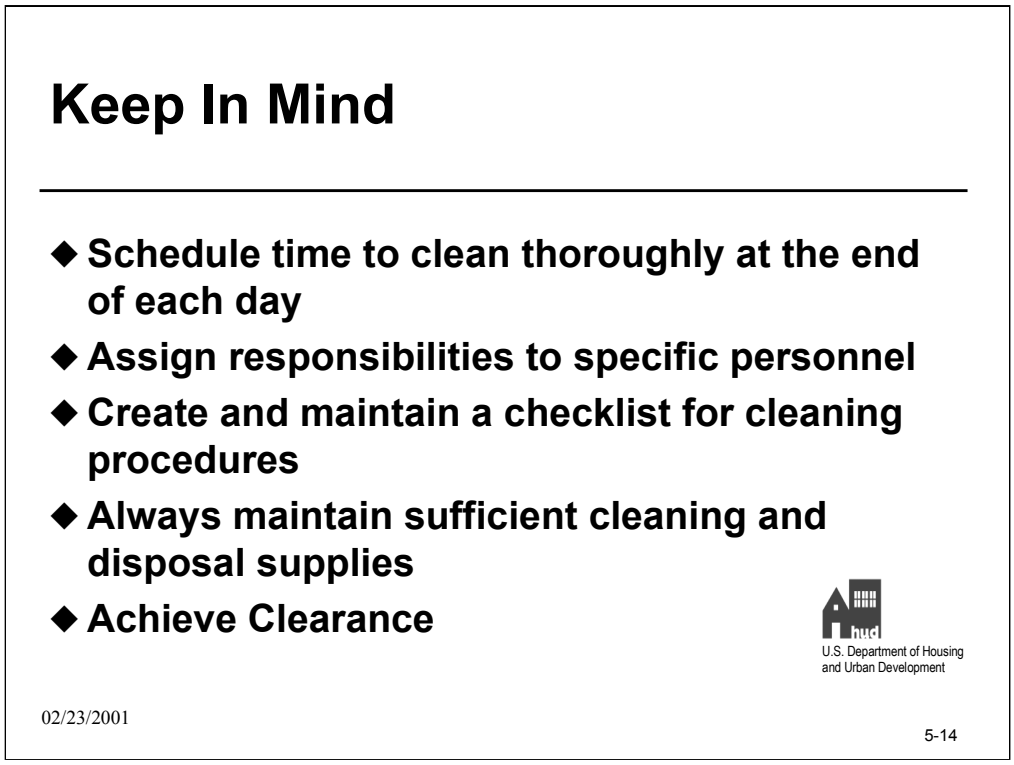


Waste disposal issues

- You should determine whether you generate more than 220 pounds of hazardous waste per job site per month. If you have less than 220 pounds per location per month then manage this waste as solid, non-hazardous waste. If you generate more than 220 pounds of hazardous waste you should contact your state and local regulators to find out how to dispose of this waste properly.
- Some **possible** examples of **hazardous waste** may include: paint chips; vacuum debris; sludge or chemical waste from strippers; and HEPA filters.
- Some **possible** examples of **non-hazardous waste** may include: disposable clothing; respirator filters; rugs and carpets; protective sheeting; and solid components with no peeling paint. Please list and suggest any other examples.
- All waste should be handled carefully and sealed in heavy duty plastic bags such as 4-6 mil poly-bags.
- Large architectural components from residential housing should be wrapped and sealed in plastic sheeting and disposed along with your waste.

Remember

- Some states have enacted more stringent waste management and disposal regulations.
- Supervisors must be aware of state regulations concerning hazardous and solid waste management and disposal.



Example check list for cleaning procedures

The list below is an example checklist for cleaning procedures. You may wish to add to or modify it to fit your needs.

- Was the work completed?
- Have all visible paint chips, dust and debris been removed and disposed?
- Was the protective sheeting folded, sealed, and disposed?
- Was the interior work area HEPA vacuumed?
- Were all surfaces wet cleaned? Was the floor cleaned last?
- Was the interior work area HEPA vacuumed again?
- Was all waste placed safely in heavy duty plastic bags such as 4-6 mil poly-bags?
- Were all bags properly sealed?
- Was all waste disposed in accordance with state and federal regulations?
- Was a visual inspection completed?
- Were dust samples taken?
- Is the property owner satisfied?